Site: ______
Break: 5.9 AR
Other: ______

10133054

RECORD OF DECISION

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

ROCHESTER PROPERTY SUPERFUND SITE

TRAVELERS REST, GREENVILLE COUNTY
SOUTH CAROLINA

PREPARED BY:

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
ATLANTA, GEORGIA

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Rochester Property Site
Travelers Rest, Greenville County, South Carolina

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Rochester Property Superfund Site (the Site), located in Travelers Rest, Greenville County, South Carolina, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), 42 U.S.C. §§ 9601 et seq., and, to the extent practicable, the National Oil and Hazardous Substances Contingency Plan (NCP), 40 C.F.R. Part 300 et seq. This decision is based on the administrative record file for this Site.

The State of South Carolina concurs with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This remedial action addresses groundwater contamination.

The major components of the selected remedy include:

- In-situ air sparging which will be accomplished by pumping air, through trench(es), and possibly wells, in the saturated zone, creating a steady flow of gas, or bubbles, that rise through the aquifer;

- Vent pipes or other venting system(s) will be placed in the subsurface to facilitate vapor discharge from the vadose zone.

- The rising bubbles will contact the dissolved organic contaminant and allow the trichloroethene (TCE) to volatilize.

- The addition of oxygen to the groundwater will promote biodegradation of bis(2-ethylhexyl)phthalate and oxidation of soluble manganese to its insoluble form.

- The insoluble manganese will then precipitate and be re-deposited in the soils, where it is already naturally occurring.

SITE MONITORING

- Regular sampling of the groundwater and surface water to monitor the concentrations and movement of contaminants.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions and alternative treatment technology to the maximum extent practicable for this Site. The selected groundwater remedy satisfies the preference for treatment.

Since selection of this remedy will result in contaminated groundwater remaining on-site above health-based levels until the remedial action is complete, a statutory 5 year review will be performed after commencement of the remedial action to insure that the remedy continues to provide adequate protection of human health and the environment.

Patrick M Tobin

Patrick M. Tobin
Acting Regional Administrator

August 31, 1993
Date

SECTION PAGE

APPENDICES

LIST OF FIGURES

LIST OF TABLES

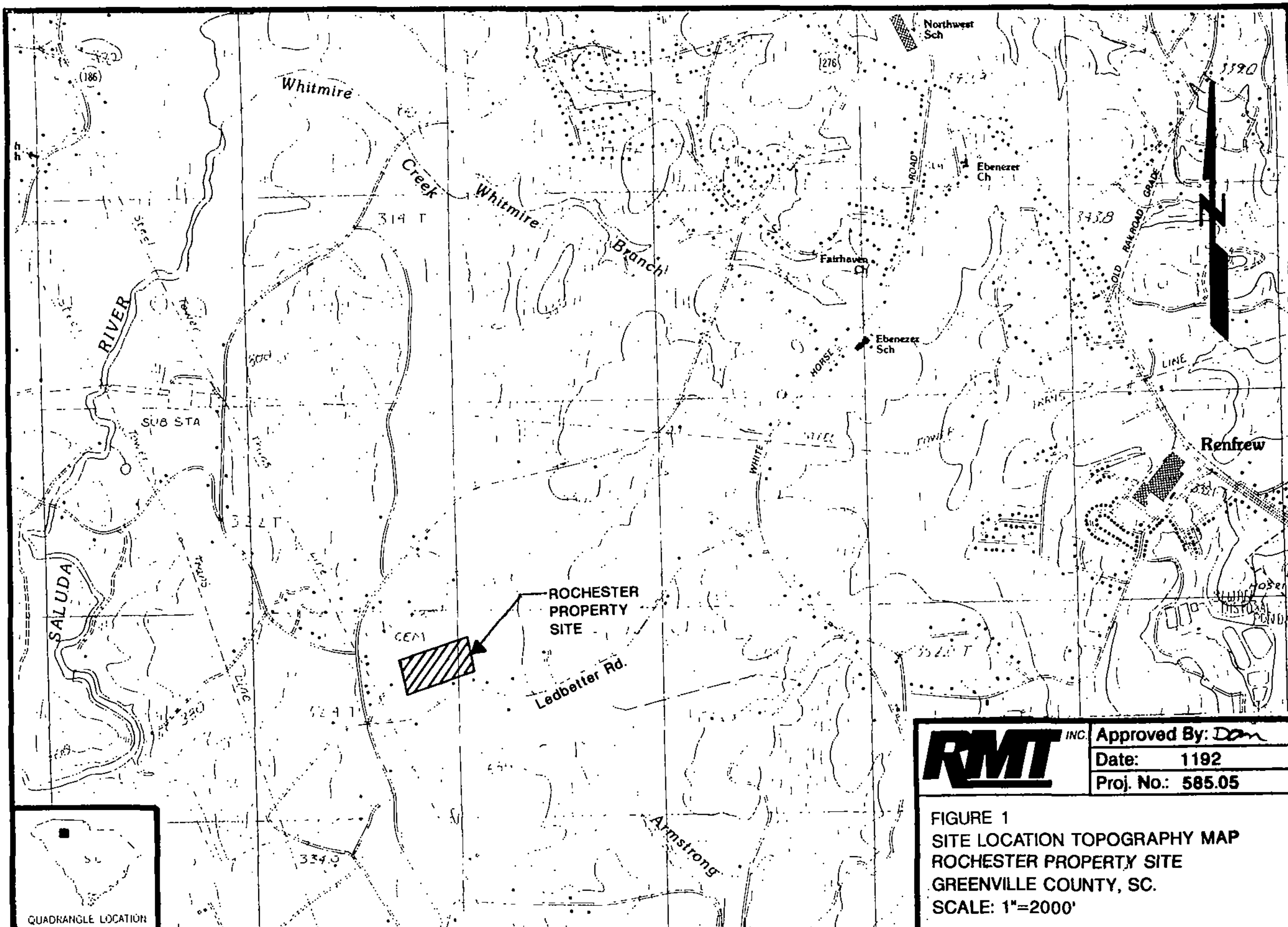
1.0 SITE LOCATION AND DESCRIPTION

The Rochester Property Site (the Site), is located in a rural unzoned portion of Greenville County, South Carolina, approximately (3) three miles west of the town of Travelers Rest (Figure 1). The Site is located north of County Road 268 and approximately one-quarter mile east of County Road 102. The Site lies approximately 300 feet north of County Road 268, also known as Ledbetter Road, on property currently owned by Carolina Properties, Greenville, Inc. The Site's geographic coordinates are 34°58'17.1" north latitude and 82°30'07.2" west longitude.

The Site consists of approximately 4.5 acres (Figure 2). The northern portion of the Site is a pine and deciduous forest, while the southern portion is a former field which has been planted with pine trees. A fence surrounds a 0.6-acre area where waste was removed from the southern portion of the Site in 1990.

The Site is located on a hill between two (2) small streams. An unnamed tributary leading to Armstrong Creek borders the Site to the north and east and flows to the east. Another small stream borders the Site to the south. This stream flows eastward and discharges into the unnamed tributary to Armstrong Creek about 400 feet east of the Site. Site surface elevations range from 1010 feet above mean sea level (MSL) at the east end of the Site to 1047 feet above MSL at the west end of the Site.

Within the one-half mile radius of the Site, it is estimated that fifty-one percent (51%) is cleared, forty-seven percent (47%) is forested, and two percent (2%) is surface water. There are four (4) predominant land use categories. These include single-family residence dwellings, agricultural lands (small farms), forest lands (timber plots), and recreation lands (hunting, fishing, or unspecified outdoor activities). No schools, hospitals, nursing homes, or similar institutions are located within this area. The area's primary water supply source is groundwater obtained from private wells. A potable water supply pipeline is present in the vicinity of most of the homes located within one-half mile of the Site.



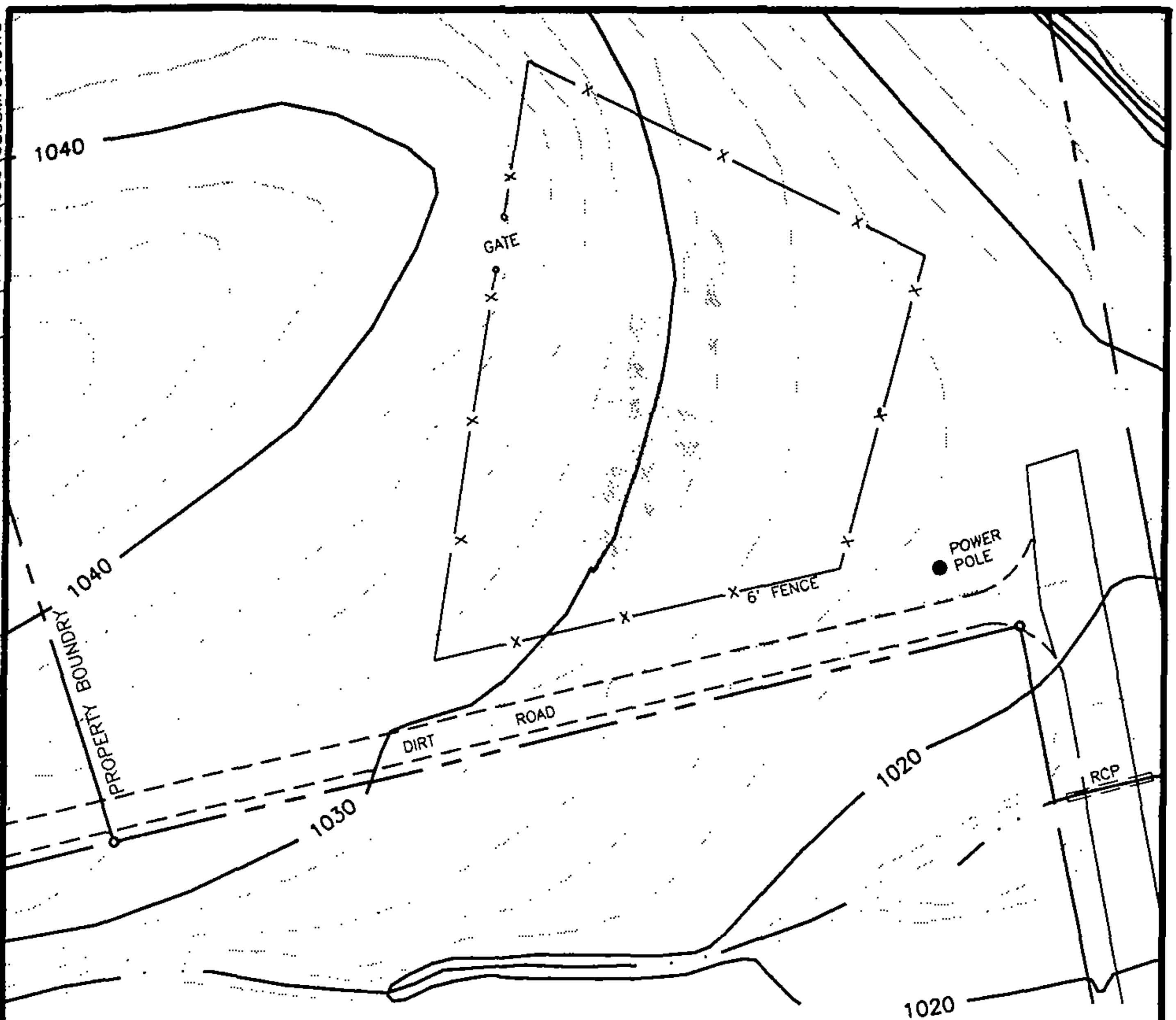
RMT INC.

Approved By:	Dan
Date:	1192
Proj. No.:	585.05

FIGURE 1
SITE LOCATION TOPOGRAPHY MAP
ROCHESTER PROPERTY SITE
GREENVILLE COUNTY, SC.
SCALE: 1"=2000'

TELEDYNE POST N32083

J:\CAD\GRAPHIC\585\585SMF01.DWG



LEGEND

LOCATION OF FORMER WASTE EXCAVATION

STREAM

PROPERTY LINE

1020 TOPOGRAPHIC CONTOURS IN FEET ABOVE MEAN SEA LEVEL. CONTOUR INTERVAL IS 2 FEET.

SURVEY DATA TAKEN FROM PLAT PREPARED BY WEBB SURVEYING & MAPPING GROUP DATED NOV. 1987.

FIGURE 2

SITE LAYOUT MAP

RMT INC.

585.05
0893

0 60 120
SCALE IN FEET

ROCHESTER PROPERTY SITE
GREENVILLE COUNTY, SC

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Site was used for disposal of wastes which are thought to include wood glue, print binders, powder materials, natural guar gums, adhesive for food packages and adhesive restick for envelopes. The waste materials were placed in four (4) trenches sometime between late 1971 and early 1972. Each of the trenches was approximately forty (40) feet long, three (3) feet wide and ten (10) feet deep.

Previous investigations at the Site began in June 1984 when the South Carolina Department of Health and Environmental Control (SCDHEC) conducted initial sampling and then subsequently performed a Site inspection on November 8, 1984. As part of the inspection, SCDHEC sampled the waste, soils, surface water, and groundwater in the area. Additional investigations were performed by Colonial Heights Packaging, Inc.'s, consultant, RMT, Inc. (RMT), in August 1987, and February 1988, and by the United States Environmental Protection Agency's (EPA) contractor, NUS Corporation, in June 1988.

Based on the analysis of the waste collected by EPA and SCDHEC, EPA ranked the Site and included it on the National Priorities List Proposed Update in the Federal Register, Vol. 51, No. 111, on Tuesday, June 10, 1986. The Site was added to the National Priorities List, pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, on October 4, 1989, with a Hazard Ranking Score of 41.34.

On June 5, 1989, EPA and Colonial Heights Packaging, Inc., signed an Administrative Order on Consent, Docket No. 89-09-C, requiring that Colonial Heights Packaging, Inc., submit a workplan to characterize the vertical and horizontal extent of affected media, remove affected materials, and perform sampling to document the effectiveness of the waste removal. The buried waste was excavated in January 1990, and disposed of off-site at a secure hazardous waste landfill.

EPA and Colonial Heights Packaging, Inc., signed another Administrative Order on Consent, Docket Number 92-04-C, dated February 19, 1992, to conduct the Remedial Investigation and Feasibility Study (RI/FS).

The first phase of field work was conducted from July 1992, to August 1992, and the second phase was conducted in December 1992. RMT submitted to EPA, on behalf of Colonial Heights Packaging, Inc., the Final RI Report in April 1993, and the Final FS Report in May 1993.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

An information repository, which includes the Administrative Record, was established at the Travelers Rest Library in 1992, and is available to the public at both the information repository maintained at the Travelers Rest Library, 315 South Main Street, Travelers Rest, South Carolina, 29690, and at EPA, Region IV Library, 345 Courtland Street, Atlanta, Georgia, 30365. The notice of availability of these documents was published in the Greenville News on June 14, 1993.

A public comment period for the proposed plan was held from June 14, 1993, to July 14, 1993. A public meeting was held on June 28, 1993, where representatives from EPA answered questions regarding the Site and the remedial alternatives under consideration, which were discussed in the proposed plan. An extension to the public comment period was requested and granted. The comment period ended August 13, 1993.

EPA received oral comments during the June 28, 1993, public meeting, and written comments during the sixty (60) day public comment period. Responses to the comments received by EPA are included in the Responsiveness Summary (Appendix A).

This ROD presents EPA's selected remedial action for the Site, chosen in accordance with CERCLA, as amended by SARA, and to the extent practicable, the NCP. The remedial action selection for this Site is based on information contained in the Administrative Record. The public and state participation requirements under Section 117 of CERCLA, 42 U.S.C. § 9617, have been met for this Site.

4.0 SCOPE AND ROLE OF THIS ACTION WITHIN SITE STRATEGY

The purpose of the remedial alternative selected in this ROD is to reduce potential future risks at this Site. There is no unacceptable current risk present at the Site. The groundwater remedial action will remove potential future risks posed by use of the contaminated groundwater, for potable water supply. This is the only ROD contemplated for this Site.

5.0 SUMMARY OF SITE CHARACTERISTICS

The RI investigated the nature and extent of contamination on and near the Site, and defined the potential risks to human health and the environment posed by the Site. A supporting RI objective was to characterize the Site-specific geology and hydrogeology. A total of forty-three (43) soil samples, twenty-nine (29) groundwater samples, eleven (11) surface water samples, and five

(5) sediment samples were collected during the RI. The main portion of the RI was conducted from July 1992, to August 1992, and December 1992. Locations of groundwater, surface soil, subsurface soil, surface water, and sediment samples are shown in Figures 3 through 7.

5.1 Meteorology

The Site is located in the Piedmont physiographic province of South Carolina on the eastern flank of the southern Appalachian Mountains. These mountains act to shield this portion of the Piedmont province from the full effect of cold fronts which move southeastward toward this area during the winter months. The winter season is characterized by temperate or moderate conditions while the summer months are warm and humid.

During the summer, the temperature rises to 90°F or above on almost half the days, but usually falls to 70°F or lower during the night. In the winter, temperatures remain below freezing through the day on only three (3) to four (4) occasions. Mean winter temperatures average in the low 30's (°F). Approximately two (2) to three (3) freezing rain storms and two (2) to three (3) small snow storms occur each winter. The mean annual temperature for this area is approximately 60°F.

Precipitation is predominately rainfall and is relatively evenly distributed throughout the year. The average annual rainfall is fifty-seven (57) inches per year.

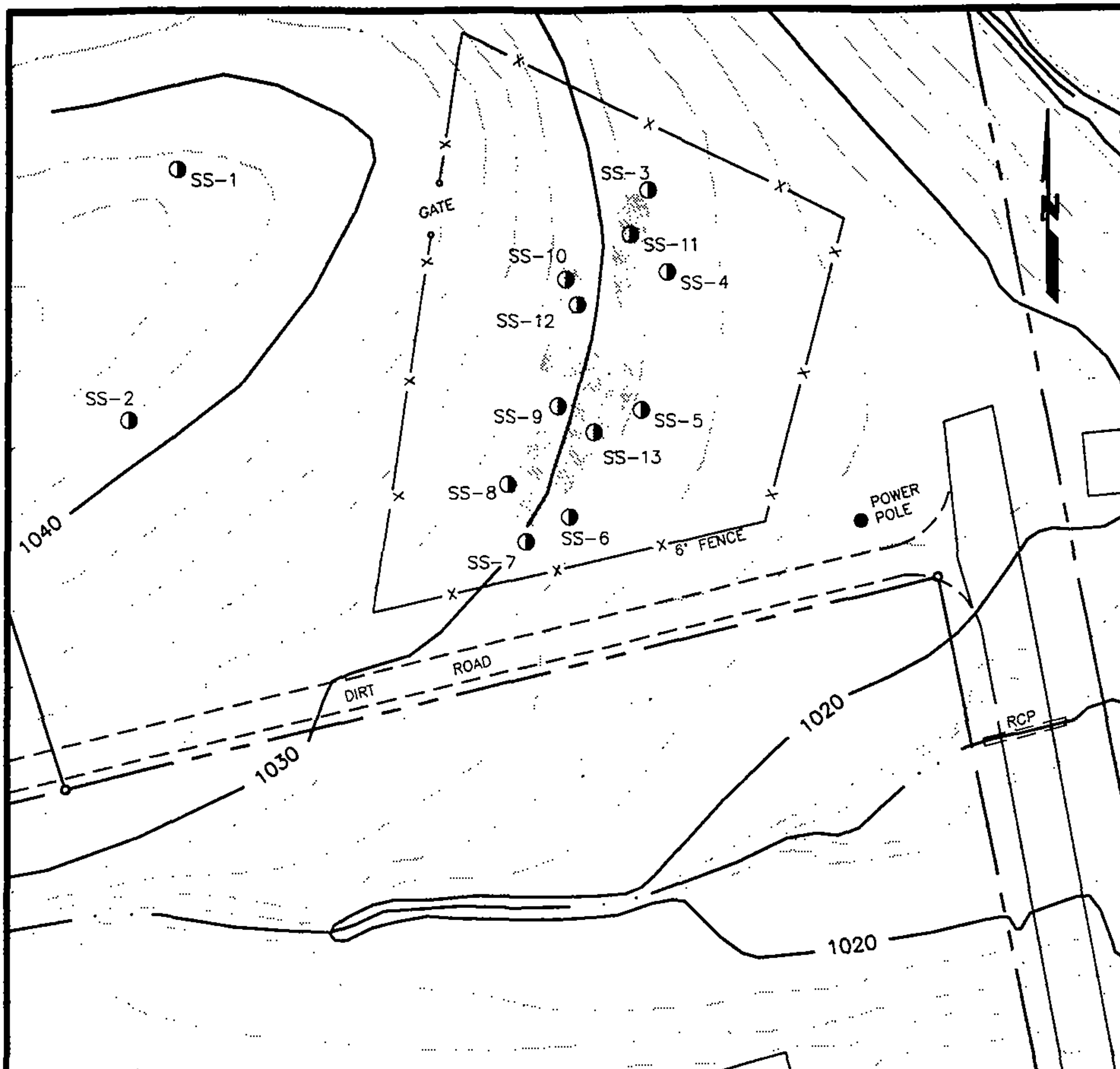
5.2 Geologic and Hydrogeologic Setting

5.2.1 Geology/Soils

The Site is situated in the Piedmont physiographic province of South Carolina. The Piedmont is a broad plateau ranging from 400 to 1200 feet above sea level. Piedmont areas are characterized by low, rounded, gently sloping hills having relatively deeply incised dendritic drainage patterns. In this area, upland Piedmont sites typically have a thick layer of highly weathered residual soil and weathered rock (saprolite) overlying competent bedrock.

Residual materials generally consist of sandy clays, sandy silts, silty sands, or silts, and often contain solid rock fragments. The contact between the saprolite and bedrock typically is gradational and is often characterized by a zone of fractured rock material. Saprolite soils often retain the fabric of the original parent rock and may have preferentially fractured zones similar to competent rock. The residual soil and saprolite thickness in the Piedmont is variable, but may be greater than eighty (80) feet.

J:\CAD\GRAPHIC\585\585SMF03.DWG



LEGEND

SS-1 SURFACE SOIL SAMPLE POINT LOCATIONS

LOCATION OF FORMER WASTE EXCAVATION

STREAM

PROPERTY LINE

1020 TOPOGRAPHIC CONTOURS IN FEET ABOVE MEAN SEA LEVEL. CONTOUR INTERVAL IS 2 FEET.

SURVEY DATA TAKEN FROM PLAT PREPARED BY WEBB SURVEYING & MAPPING GROUP DATED NOV. 1987.

FIGURE 3

SURFACE SOIL SAMPLING POINTS

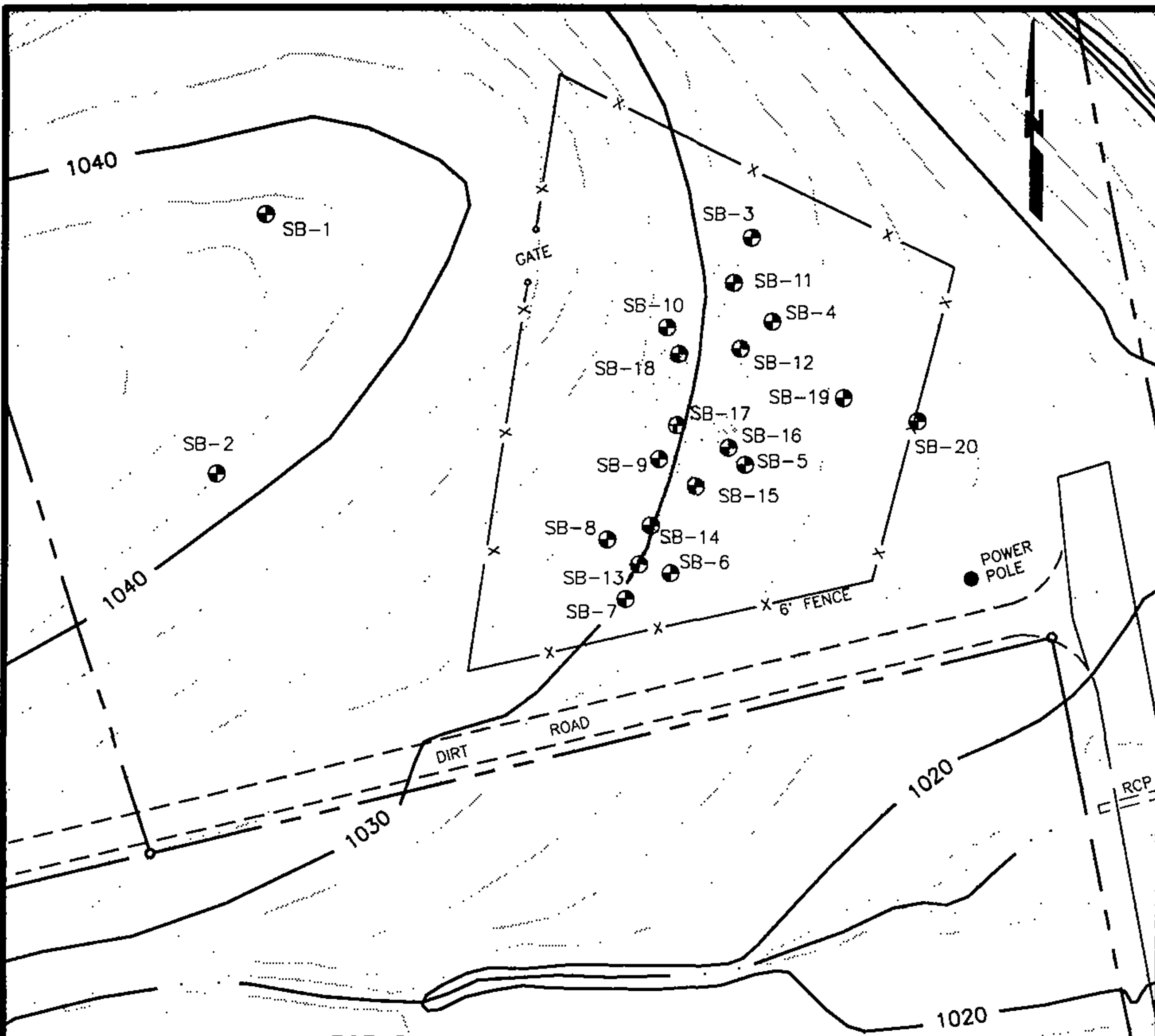
RMT INC.

585.06
0893

0 60 120
SCALE IN FEET

ROCHESTER PROPERTY SITE
GREENVILLE COUNTY, SC

J:\CAD\GRAPHIC\585\585SMF04.DWG



LEGEND

SB-1 SOIL BORING LOCATIONS

LOCATION OF FORMER WASTE EXCAVATION

STREAM

PROPERTY LINE

1020 TOPOGRAPHIC CONTOURS IN FEET ABOVE MEAN SEA LEVEL. CONTOUR INTERVAL IS 2 FEET.

SURVEY DATA TAKEN FROM PLAT PREPARED BY WEBB SURVEYING & MAPPING GROUP DATED NOV. 1987.

FIGURE 4

SUBSURFACE SOIL SAMPLING POINTS

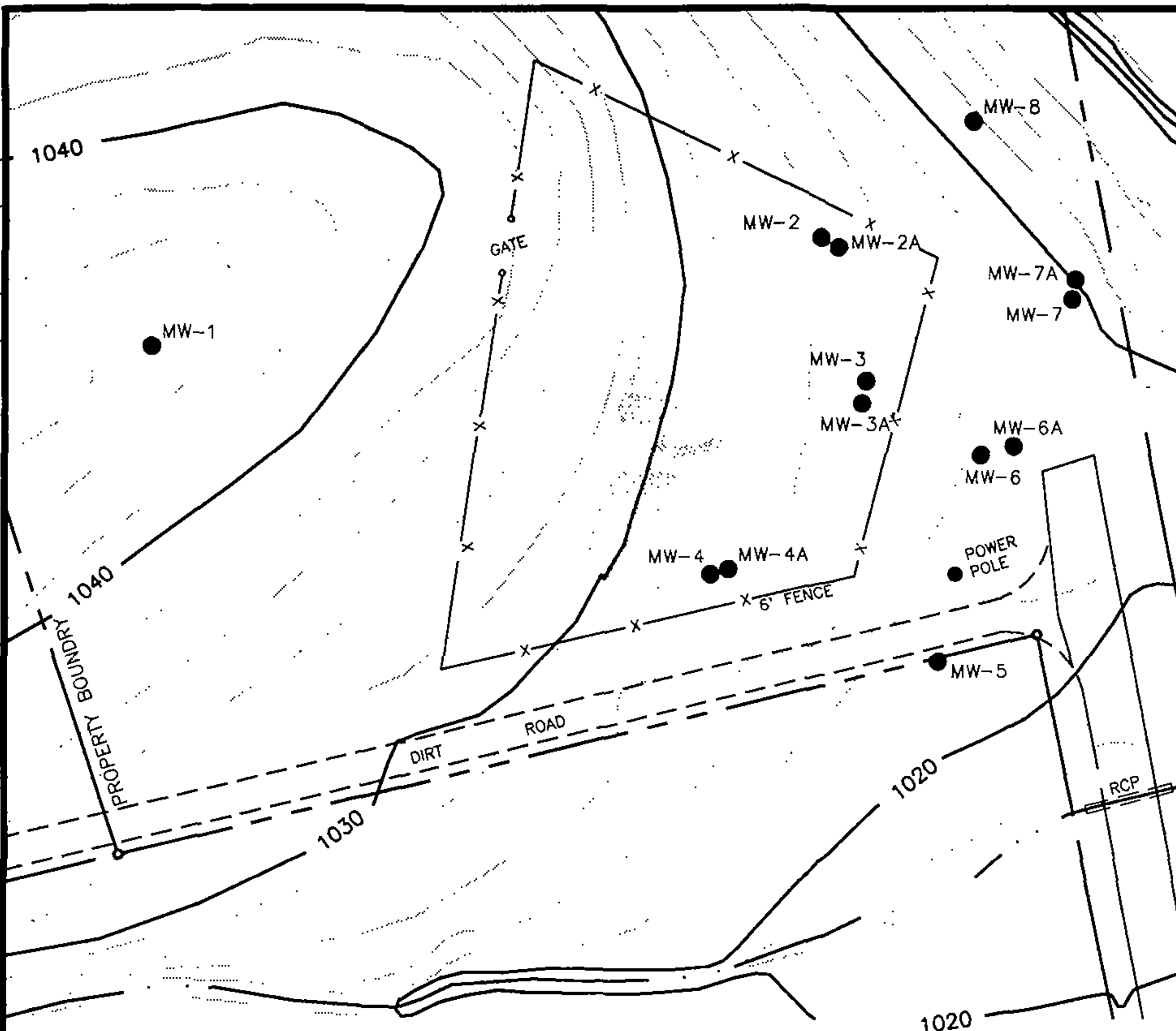
RMT INC.

585.06
0893

0 60 120
SCALE IN FEET

ROCHESTER PROPERTY SITE
GREENVILLE COUNTY, SC

J:\CAD\GRAPHIC\585\585SMF02.DWG



LEGEND

MW-1 MONITORING WELL LOCATIONS

LOCATION OF FORMER WASTE EXCAVATION

STREAM

PROPERTY LINE

1020 TOPOGRAPHIC CONTOURS IN FEET ABOVE MEAN SEA LEVEL. CONTOUR INTERVAL IS 2 FEET.

SURVEY DATA TAKEN FROM PLAT PREPARED BY WEBB SURVEYING & MAPPING GROUP DATED NOV. 1987.

FIGURE 5

GROUND WATER SAMPLING POINTS

RMT INC.

585.05
0893

0 60 120
SCALE IN FEET

ROCHESTER PROPERTY SITE
GREENVILLE COUNTY, SC

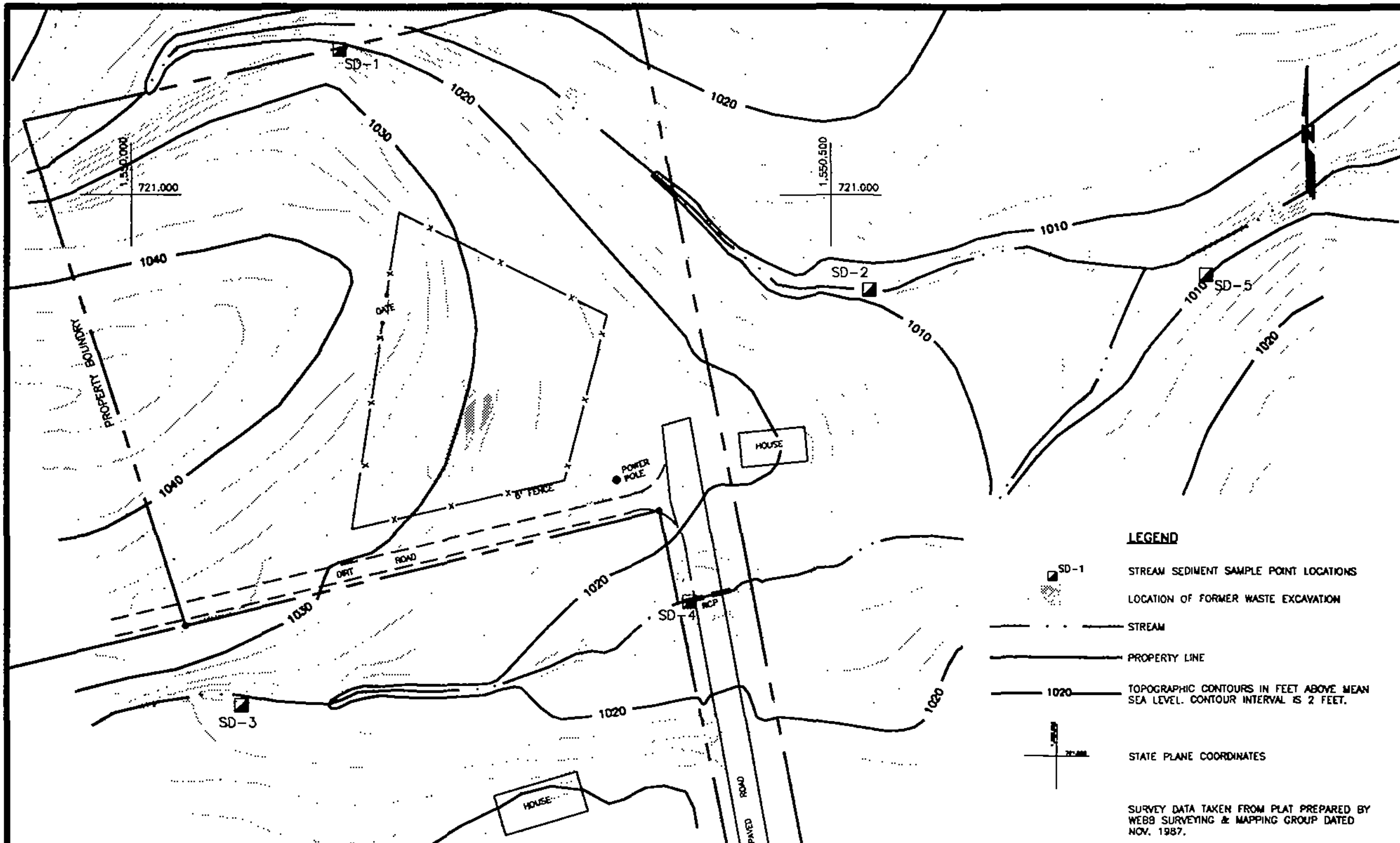


FIGURE 6

STREAM SEDIMENT SAMPLING POINTS

SCALE 1" = 100'

RMT INC.

585.05
0893

ROCHESTER PROPERTY SITE
GREENVILLE COUNTY, SC

J:\CAD\GRAPHIC\585\585SMF05.DWG

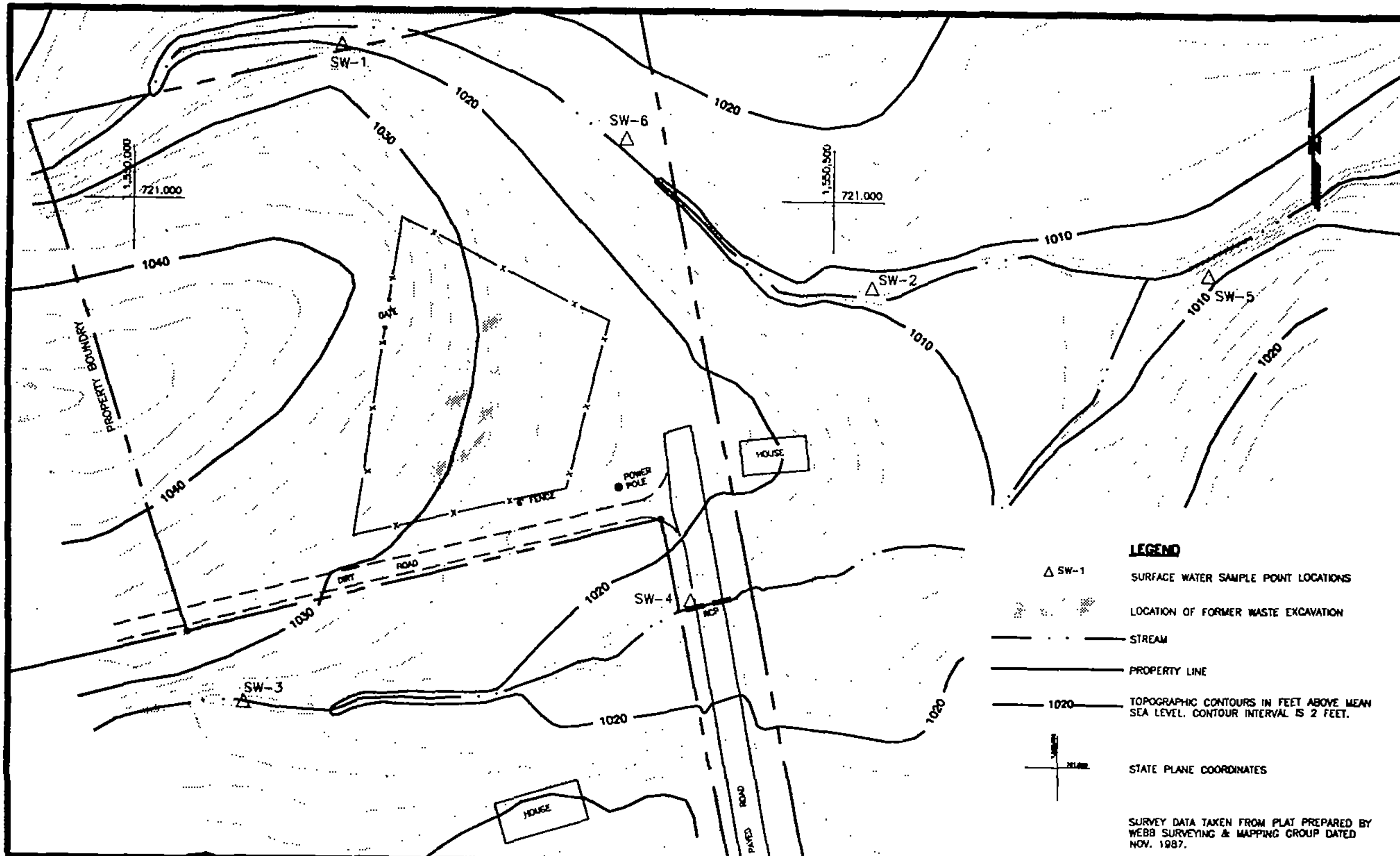


FIGURE 7
SURFACE WATER SAMPLING POINTS

0 100 200
SCALE IN FEET

585.05
0893

ROCHESTER PROPERTY SITE
GREENVILLE COUNTY, SC

J:\CAD\GRAPHIC\585\585SMF06.DWG

The Piedmont province is characterized by metamorphic rocks which have been intruded by igneous rocks. These rocks are predominately granites, gneisses, schists, and associated metamorphosed sediments. Rock assemblages may include granite, mica schist, granite gneiss, gneiss-schist complexes, mica-granite gneiss, and diabase dikes. Rock composition ranges from felsic (predominately acid silicates) to mafic (predominately basic silicates). The top of bedrock surface, at the Site, was encountered, at depths ranging from 50.2 to 69.5 feet below land surface. No bedrock outcrops were observed on the Site property or in the channel ways of the north and south streams, however, from examinations of saprolite soil samples, the bedrock beneath the Site is probably a gneiss of granitic origin.

The soils encountered at the Site are formed by the in-place weathering of the underlying bedrock. The exception is the fill material encountered in the former waste disposal trenches. Two (2) categories of undisturbed soil, residual soil, and saprolite, are present on-site, mantling the bedrock. Residual soils are the product of a high degree of weathering and thoroughly decomposed bedrock. Saprolite is weathered decomposed in-place rock which is characterized by its retention of the original fabric or structure of the parent bedrock.

The residual soil thickness encountered in borings ranged from 2.5 to 10.5 feet. These materials were classified as silts, clayey silts, or silty clays. The observed thickness of the underlying saprolite ranged from forty-five (45) to sixty (60) feet. These saprolitic materials were classified as silts except near bedrock contacts where silty sands were encountered. The saprolite present at the Site is typically highly micaceous due to the nature of the underlying rock from which the saprolite developed. Sample natural moisture content ranged from 14.1 to 53.5 percent.

5.2.2 Hydrogeology

Information on the hydrogeology of the Site was obtained from the thirteen (13) monitoring wells installed during the RI. Groundwater at the Site is first encountered in the unconsolidated soil zones overlying bedrock. The water table was encountered at depths ranging from approximately 5.5 feet below surface grade to approximately twenty-three (23) feet below surface grade. The direction of groundwater flow within the saprolite aquifer is to the east-northeast towards the north stream segment where it likely discharges. Water level measurements collected from top of rock wells show that these wells are screened in an unconfined aquifer and that the deeper portion of this water table aquifer also flows toward the northeast. The horizontal hydraulic gradient is approximately 0.028 feet per foot. Aquifer tests show the horizontal hydraulic conductivity (k) of the surficial aquifer is in the 10^{-4} cm/sec range. The range of test values was from 2.8 x 10^{-3} cm/sec (or 7.8 feet/day) to 4.7 x 10^{-5} cm/sec (or 0.1 feet/day). The geometric mean of hydraulic conductivity values of water table wells was 5.9 x 10^{-4} cm/sec (or 1.7 feet/day). The geometric mean of hydraulic conductivity values of top of bedrock wells was 1.4 x 10^{-4} cm/sec (or 0.4 feet/day). The geometric mean of hydraulic conductivity values of all Site wells was 3.4 x 10^{-4} cm/sec (or 0.9 feet/day).

Vertical hydraulic conductivity results for representative aquifer soil samples, as determined from laboratory falling head tests on Shelby tube samples, *range* from 4.5 x 10^{-4} cm/sec, to 1.7 x 10^{-6} cm/sec. The geometric mean of laboratory determined vertical permeability value of representative aquifer samples was 8.2 x 10^{-5} cm/sec (or 0.2 feet/day). There is apparently little variation in this aquifer's permeability in the vertical (0.9 feet/day) and horizontal (0.2 feet/day) directions.

The surficial aquifer's estimated average horizontal velocity is 0.10 feet per day or approximately thirty-nine (39) feet per year (assuming an effective porosity of 0.25 percent). More conservatively, if the aquifer's groundwater flow is calculated using 0.42 percent (the average of all silts) as an estimate of porosity, the horizontal velocity is 0.06 feet per day or approximately twenty (23) feet per year. This range of values is consistent with the range of velocities expected in silty saprolitic aquifers.

5.3 Nature and Extent of Contamination

Environmental contamination at the Site can be summarized as follows:

Groundwater Contamination. Seven (7) monitoring wells were installed during the first phase of field work and were sampled twice and analyzed for all TCL/TAL parameters. Six (6) additional wells were installed during the second phase of field work. All thirteen (13) wells were then sampled and analyzed for all TCL/TAL parameters except pesticides. Three (3) contaminants of concern (COCs), trichloroethene (TCE), bis(2-ethylhexyl) phthalate, and manganese, were detected in the groundwater in the saprolite aquifer.

Levels of the TCE ranged from the detection limit (normally 0.010 mg/l), to 0.180 mg/l. TCE concentrations exceeded the Maximum Contaminant Level (MCL) for this contaminant in three (3) of the thirteen (13) wells.

Bis(2-ethylhexyl)phthalate was detected in two (2) wells during the first sampling event; 0.033 mg/l (though the duplicate was 0.013 mg/l) in one well, and 0.013 mg/l in the other well.

During the second sampling event, bis(2-ethylhexyl)phthalate was detected in only one of these wells at 0.009 mg/l. It was not detected in any wells during the third sampling event, and was detected in the blanks for all the sampling events. The levels detected in the blanks for the first sampling round was .0005 mg/l in the method blanks, up to .008 mg/l in the field blanks, and .033 mg/l in the rinsate blanks. Bis(2-ethylhexyl)phthalate was found at .0004 mg/l in the method blank during the second round of sampling, but was not detected in the field or rinsate blanks. The MCL for bis(2-ethylhexyl)phthalate is 0.006 mg/l.

Manganese levels ranged from the detection limit to 1.39 mg/l, and exceeded the risk-based criterion (.180 mg/l), derived in the Baseline Risk Assessment, in five (5) of the thirteen (13) wells.

Surface Water Contamination. Samples from the unnamed creek, northeast of the Site, showed levels of TCE at 0.016 mg/l at one location and 0.005 mg/l at a second location. Extremely low levels of seven (7) other volatile organic compounds (VOCs), below 0.005 mg/l, were detected. The TCE value is below the Ambient Water Quality Criteria of 21.9 mg/l. Inorganic parameters that were detected were within background ranges.

Soil and Sediment Contamination. Insignificant levels of various substances were detected in the soil and sediment samples. The levels detected did not exceed background levels for the inorganics and were primarily below 0.5 mg/l for the organics.

6.0 SUMMARY OF SITE RISKS

A Baseline Risk Assessment was conducted to evaluate the risks present at the Site to human health and the environment, under present day conditions and under assumed future use conditions.

The purpose of a Baseline Risk Assessment is to provide a basis for taking action and to identify the contaminants and the exposure pathways that need to be addressed by the remedial action. It serves as an indication of the risks posed by the Site if no action were to be taken.

This section of the ROD contains a brief summary of the results of the Baseline Risk Assessment conducted for the Site. Currently, there is no one living on the Site, and only a few persons residing close to the Site. There are potable water supply wells within one-half mile of the Site, however, there is also municipal water available. Future land use will likely remain residential, with the potential for future resident use of groundwater as a potable water source.

Carcinogenic risk and noncarcinogenic Hazard Index (HI) ratios were calculated for both the current land use scenario, with residents near the Site, and the anticipated future land use scenario, which is residential use. The Baseline Risk Assessment determined that the total cancer risk (using Reasonable Maximum Exposure) for the **current** residential scenario is less than 1×10^{-6}. Therefore, the Site does not pose an unacceptable cancer risk under the current exposure scenario. The total Hazard Index for the **current** resident is 0.038. This hazard index is well below any level of concern for noncarcinogens (1.0) and indicates the Site does not pose an unacceptable non-carcinogenic risk under the current exposure scenario evaluated in the Baseline Risk Assessment. Therefore, there is no unacceptable **current** risk at the Rochester Property Site.

The Baseline Risk Assessment also determined that the total cancer risk for the **future** Site residential scenario was 6.8×10^{-5}. This risk level is within the EPA acceptable risk range (1×10^{-4} to 1×10^{-6}). However, EPA may decide that a baseline risk level less than 10^{-4} (i.e., a risk between 10^{-4} and 10^{-6}) is unacceptable due to site-specific conditions and that remedial action is warranted. For the Site, EPA believes that a Remedial Action is warranted, since the future land use will probably be residential, and MCLs were exceeded for the organic contaminants. The Hazard Index for the **future** Site residential scenario was 8.9 for an adult; this level exceeds the acceptable hazard index of 1.0. The non-carcinogenic risk is attributable to the ingestion of the manganese present in the groundwater.

No substantial risk to wildlife or the environment was found to exist under present or future conditions.

The Baseline Risk Assessment concluded that the surface soils, the surface water, and the sediments at the Site are not media of concern. During the FS, it was determined that the subsurface soil was not a media of concern. The Baseline Risk Assessment determined that the groundwater was the only media posing an unacceptable level of risk to human health or the environment. The actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial endangerment to public welfare or the environment.

6.1 Contaminants of Concern

Data collected during the RI were evaluated in the Baseline Risk Assessment. Contaminants were not included in the Baseline Risk Assessment evaluation if any of the following criteria applied:

* If an inorganic compound or element, it was not detected at or above twice the background concentration.

* If an inorganic compound or element, it was detected at low concentrations, had very low toxicity, and was judged to be naturally occurring.

* The data included analytical results flagged as "N" (presumptive evidence) or "R" (not usable).

The results of the Baseline Risk Assessment concluded that the only media of concern was the groundwater, and that the contaminants of concern were trichloroethene (TCE), bis(2-ethylhexyl)phthalate, and manganese. Levels of the TCE ranged from nondetect (the detection limit was normally 0.010 mg/l), to 0.180 mg/l. Bis(2-ethylhexyl)phthalate levels ranged from nondetect to 0.033 mg/l. Manganese levels ranged from nondetect to 1.39 mg/l.

For each contaminant of concern, exposure point concentrations were determined in the Baseline Risk Assessment. The upper ninety-five percent (95%) confidence limit of the arithmetic means of all detections was used, unless it exceeded the maximum detected concentration. If this occurred then the maximum detected concentration was used. The exposure point concentrations calculated in the Baseline Risk Assessment were 0.050 mg/l for TCE, 0.033mg/l for bis(2-ethylhexyl)phthalate, and 1.39 mg/l for manganese.

6.2 Exposure Assessment

The Site is located in a residential area that is expected to remain as such, though currently there is no on-site resident. There are potable wells within a half-mile radius of the Site, however municipal water is available. Based on this information, the Baseline Risk Assessment determined that there was only one reasonable exposure pathway, the ingestion of the contaminated groundwater.

The Baseline Risk Assessment also determined that the only population that could potentially be exposed to Site contaminants would be a potential future on-site resident, and only if the resident installed a private well. It was determined that there was no current exposure pathway or current exposed population.

For exposure to the contaminants by a resident, it was assumed that the resident would ingest two (2) liters per day of groundwater for 350 days a year for a thirty (30) year period. It was assumed that a child would be exposed for the same time period, but would only consume 1 liter per day of water.

6.3 Toxicity Assessment of Contaminants

The purpose of the toxicity assessment is to assign toxicity values (criteria) to each chemical evaluated in the Baseline Risk Assessment. The toxicity values are used in combination with the estimated doses to which a human could be exposed (as discussed in the Risk Characterization subsection of the Baseline Risk Assessment) to evaluate the potential human health risks associated with each contaminant. Human health criteria developed by EPA (cancer slope factors and non-cancer reference doses) were preferentially obtained from the Integrated Risk Information System (IRIS, 1993) or the 1992 Health Effects Assessment Summary Tables (HEAST; EPA, 1992). In some cases the Environmental Criteria Assessment Office (ECAO, 1992) was contacted to obtain criteria for chemicals which were not listed in IRIS or HEAST.

Slope factors (SF) have been developed by EPA for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic contaminants of concern. SFs, which are expressed as risk per milligram per kilogram of dose, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level.

The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Slope factors are derived from the results of human epidemiological studies or chromic animal bioassay data to which mathematical extrapolation from high to low dose, and from animal to human dose, has been applied, and statistics to account for uncertainty have been applied (e.g. to account for the use of animal data to predict effects on humans).

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to the chemicals of concern exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of daily exposure levels for humans, including sensitive subpopulations, that are likely to be without risk of adverse effect. Estimated intakes of contaminants of concern from environmental media (e.g. the amount of a chemicals of concern ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans).

Carcinogenic contaminants are classified according to EPA's weight-of-evidence system. This classification scheme is summarized below:

Group A: Known human carcinogen.

Group B1: Probable human carcinogen, based on limited human epidemiological evidence.

Group B2: Probable human carcinogen, based on inadequate human epidemiological evidence but sufficient evidence of carcinogenicity in animals.

Group C: Possible human carcinogen, limited evidence of carcinogenicity in animals.

Group D: Not classifiable due to insufficient data.

Group E: Not a human carcinogen, based on adequate animal studies and/or human epidemiological evidence.

Both TCE and bis(2-ethylhexyl)phthalate are classified as B2 carcinogens. The slope factor used for TCE was 1.10E-02 (the reference used was ECAO, 1992) and the slope factor used for bis(2-ethylhexyl)phthalate was 1.40E-02 (IRIS, 1993). Manganese is a noncarcinogen that potentially could affect the central nervous system. The reference dose used for manganese was 5.00E-03 (IRIS, 1993).

6.4 Risk Characterization

The final step of the Baseline Risk Assessment, the generation of numerical estimates of risk, was accomplished by integrating the exposure and toxicity information.

For a carcinogen, risks are estimated as the incremental probability of an individual developing cancer over a life-time as a result of exposure to the carcinogen. Excess life-time cancer risk is calculated from the following equation:

Risk = CDI x SF

where:

Risk = a unitless probability (e.g. 2×10^{-5}) of an individual developing cancer,

CDI = chronic daily intake averaged over seventy (70) years (mg/kg-day), and

SF = slope-factor, expressed as $(mg/kg\text{-}day)^{-1}$

These risks are probabilities that are generally expressed in scientific notation (e.g. 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-5} indicates that, as a reasonable maximum estimate, an individual has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure to a carcinogen over a seventy (70) year lifetime under the specific exposure conditions at a Site.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., life-time) with a reference dose derived for a similar exposure period. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ less than 1 indicates that a receptor's dose of a single contaminant is less than the RfD, and that the toxic noncarcinogenic effects from that chemical are unlikely. By adding the HQs for all chemical(s) of concern that affect the same target organ (e.g. liver) within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index (HI) is generated. An HI less than 1 indicates that, based on the sum of all HQs from different contaminants and exposure routes, toxic noncarcinogenic effects from all contaminants are unlikely.

The HQ is calculated as follows:

Non-cancer HQ = CDI/RfD

where:

CDI = Chronic Daily Intake

RfD = reference dose; and

CDI and RfD are expressed in the same units and represent the same period (i.e., chronic, subchronic, or short-term).

It was determined in the Baseline Risk Assessment that there is no current unacceptable carcinogen or noncarcinogen risk at the Site.

Under the future use scenario, the lifetime carcinogenic risk is estimated to be 6.8×10^{-5}. The estimated lifetime carcinogenic risk is due to the potential ingestion of organic contaminants in the groundwater, primarily TCE, 1.3×10^{-5}, as well as, bis(2-ethylhexyl)phthalate, 6.9×10^{-6}. Though not contaminants of concern, (all were detected below 0.004 mg/l), the following chemicals contributed to the derived carcinogenic risk number: benzene (3.45×10^{-6}), chloroform (6.44×10^{-6}), bromodichloromethane (3.69×10^{-6}), and beryllium (3.45×10^{-5}).

Under the future use scenario, the lifetime noncarcinogenic risk, is estimated to be HI = 8.9. The risk is due to the potential ingestion of inorganic contaminants in the groundwater, primarily manganese (HQ = 7.74), as well as TCE (HQ = 0.454). Also included in the derived number, though not a COC, is Butylbenzlphthalate, HQ = 0.235.

The actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

7.0 DESCRIPTION OF GROUNDWATER REMEDIAL ALTERNATIVES

The FS considered a wide variety of general response actions and technologies for remediating groundwater. No other media at the Site require remedial action. Table 1 summarizes these response actions and technologies, and provides the rationale for why each was retained or rejected for further consideration in the development of remedial alternatives.

Based on the FS, Baseline Risk Assessment, and Applicable or Relevant and Appropriate Requirements (ARARs), the remedial action objectives (RAOs) listed below were established for the Site. Alternatives were developed with the goal of attaining these objectives:

- Reduce to acceptable levels the excess risk to humans and environmental receptors associated with the media and contaminants of concern at the Site. This will be accomplished by reduction in the concentrations of contaminants that result in excess risk to human health and the environment.

- Reduce the potential to ingest groundwater from the Site containing:

TABLE 1

SCREENING OF REMEDIAL TECHNOLOGIES
ROCHESTER FEASIBILITY STUDY

GENERAL RESPONSE ACTIONS	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	EFFECTIVENESS	IMPLEMENTABILITY	RELATIVE COST
MEDIUM: GROUND WATER					
No Action	Monitoring	Sampling	Useful means of documenting characteristics of ground water, but does not alter ground water contamination.	Technically implementable.	Low capital, moderate O&M
Institutional Action	Access Restrictions	Deed Restrictions	Dependent upon continued implementation in the future. Does not affect ground water contamination.	Requires legal assistance for development of specific components and legal authority for ensurance of implementation.	Low capital and O&M
		Water Treatment	Effective means of preventing exposure to ground water.	Technically implementable. Not necessary due to lack of affected private wells.	Moderate capital, moderate O&M
	Alternate Water Supply	Municipal Water Supply	Effective means of preventing exposure to ground water.	Technically implementable. Not necessary due to lack of affected private wells. Requires approval by local utility authority.	Moderate to high capital, low O&M
Containment	Vertical Barriers	Slurry Walls	Effective in containing ground water flow.	Depth to bedrock is too great to be implemented at site.	Moderate to high
		Sheet Piles	Effective in containing ground water flow.	Depth to bedrock is too great to be implemented at site.	Moderate to high
		Injected Screens	Effective in containing ground water flow.	Depth to bedrock is too great to be implemented at site.	Moderate to high
		Grout Curtain	Effective in containing ground water flow.	Depth to bedrock is too great to be implemented at site.	Moderate to high
Removal	Extraction	Extraction Wells	Effectiveness is dependent on aquifer characteristics.	Implementable and typically acceptable to regulatory agencies.	Moderate capital, low O&M

Screened = Process options will not be considered further.

TABLE 1 (Continued)

SCREENING OF REMEDIAL TECHNOLOGIES
ROCHESTER FEASIBILITY STUDY

GENERAL RESPONSE ACTIONS	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	EFFECTIVENESS	IMPLEMENTABILITY	RELATIVE COST
Removal (Continued)	Extraction (Continued)	Collection Trench	Effectiveness is dependent on aquifer characteristics.	Depth to bedrock is too great to be implemented at site.	Moderate to low capital, low O&M
Treatment	Biological Treatment	Batch Biodegradation	Potentially effective for removal of organics. Bench testing required to determine effectiveness.	Not technically implementable due to low concentration of organic contaminants.	Moderate to high capital and O&M
		In-Situ Biodegradation	Potentially effective for removal of organics. Increased oxygen may reduce dissolved manganese.	Technically implementable as a component of alternative	Moderate capital and O&M
	Physical Chemical	Air Stripping	Effective for treatment of VOCs.	Can be implemented in conjunction with other technologies.	Low capital, moderate O&M
		In-Situ Air Sparging	Effective for treatment of organic compounds and manganese. Will serve as oxygen supply to enhance biological degradation.	Technically implementable	Low capital, moderate O&M
		Carbon Adsorption	Effective on most dissolved organics	Can be implemented in conjunction with other technologies.	High capital, moderate to high O&M.
		Chemical Oxidation	Effective for degradation of organic wastes. Will aid precipitation of manganese.	Presence of manganese would require pretreatment to prevent fouling of UV lamps.	Moderate to high capital and O&M. Not cost effective.
		Chemical Precipitation through aeration	Effective for removal of metals, including manganese.	Can be implemented in conjunction with other technologies.	High capital and moderate to high O&M.

Screened = Process options will not be considered further.

TABLE 1 (Continued)

SCREENING OF REMEDIAL TECHNOLOGIES
ROCHESTER FEASIBILITY STUDY

GENERAL RESPONSE ACTIONS	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	EFFECTIVENESS	IMPLEMENTABILITY	RELATIVE COST
Treatment (Continued)	Physical Chemical (Continued)	Filtration	Effective for removal of precipitated metals, including manganese.	Can be implemented in conjunction with other technologies.	Moderate to high capital and O&M.
		Greensand Filter	Effective for removal of iron and manganese.	Can be implemented in conjunction with other technologies.	Moderate to high capital and O&M. Not cost effective for small mass loading of manganese expected.
		Ion Exchange	Effective for removal of metals, including manganese.	Can be implemented in conjunction with other technologies.	Moderate to high capital and O&M. Not cost effective for small mass loading of manganese expected.
		Reverse Osmosis	Can effectively concentrate inorganic contaminants of concern. TCE and BEHP could cause loading problems.	Can be implemented in conjunction with other technologies.	Moderate to high capital and O&M. Not cost effective for small mass loading of manganese expected.

Screened = Process options will not be considered further.

TABLE 1 (Continued)

SCREENING OF REMEDIAL TECHNOLOGIES
ROCHESTER FEASIBILITY STUDY

GENERAL RESPONSE ACTIONS	REMEDIAL TECHNOLOGY	PROCESS OPTIONS	EFFECTIVENESS	IMPLEMENTABILITY	RELATIVE COST
Disposal	On-Site Disposal	Local Stream	Effective and reliable discharge method.	May requires NPDES discharge permit (if off-site).	Low capital, very low O&M.
		Infiltration	Rate of infiltration limited in soils with low hydraulic conductivities.	Technically implementable.	Moderate capital, low to very low O&M.
	Off-Site Disposal	POTW	Effective and reliable discharge method.	Sewer not locally available. Waste must be hauled to POTW.	Low capital, high O&M.

Screened = Process options will not be considered further.

- Carcinogen concentrations above Federal or State standards, or in the absence of standards, above levels that would exceed an acceptable cancer risk range of 10^{-4} to 10^{-6} (unless the risk manager decides that a risk level less than 10^{-4} (i.e., a risk between 10^{-4} and 10^{-6}) is unacceptable due to site-specific conditions);

- Noncarcinogen concentrations above Federal or State standards, or in the absence of standards, above levels that would exceed an acceptable Hazard Index (HI) of 1.0.

Technologies considered potentially applicable to groundwater contamination (Table 1, Section 7.0 above) were further evaluated on effectiveness and implementability. Listed below are those alternatives which passed this final screening, and are proposed for groundwater remediation.

The remedial alternatives are listed below. The last groundwater alternative is a set ("A" and "B"), Alternative 4A and 4B differ only in which option is used for discharging treated groundwater.

Alternative 1: No Action

Alternative 2: Institutional Controls and Access Restrictions

Alternative 3: In-Situ Air Sparging

Alternative 4A: Groundwater Recovery with Air Stripping, Filtration, and Carbon Adsorption, with Surface Water Discharge

Alternative 4B: Groundwater Recovery with Air Stripping, Filtration, and Carbon Adsorption, with Discharge to Infiltration Trenches

Each of the five (5) alternatives is discussed below. Alternative 1 will not meet the remediation goals presented in Section 9.1.3 of this ROD. Alternative 2 should meet the remediation goals through natural attenuation. Alternatives 3, 4A, and 4B will meet the remediation goals through treatment.

"O&M costs" refer to the costs of operating and maintaining the treatment described in the alternative, for an assumed period of ten (10) years, and/or monitoring the groundwater for an assumed period of thirty (30) years. All of the five (5) alternatives have anticipated O&M costs. O&M costs were calculated using a five percent (5%) discount rate per year.

The components of Alternative 2, institutional controls and groundwater monitoring, are included for all alternatives except Alternative 1, the "no action" alternative, which would not have the access restrictions and/or deed restrictions.

Certain ARARs (see Section 9) are applicable, or relevant and appropriate, to each of the groundwater remedial alternatives. Site groundwater is classified by South Carolina as Class GB (SC Water Classifications and Standards, Regulation 61-68), and by EPA as Class IIA (Guidelines for Ground Water Use and Classification, EPA Ground Water Protection Strategy, US EPA 1986).

Alternative 1 would not meet the relevant and appropriate ARARs, identified in Section 9, concerning groundwater as a potable water source. These are the National Primary and Secondary Drinking Water Standards, promulgated in 40 C.F.R. Parts 141-143, and the State of South Carolina Primary Drinking Water Regulations, SC Reg. 61-58. These ARARs would not be met because Site groundwater violates MCLs specified in these regulations.

In addition, the CERCLA preference for treatment to reduce the toxicity, mobility, or volume of the contaminants, wherever possible, would not be satisfied by Alternatives 1 or 2.

Alternative 2 would not meet the CERCLA preference for treatment. Assuming successful implementation, however, it would meet the relevant and appropriate drinking water standards specified above, albeit at a very slow rate. The remaining alternatives, 3, 4A, and 4B, would achieve these standards, and would also meet the CERCLA preference for treatment.

Alternatives 3, 4A, and 4B, would be subject to the following applicable or relevant and appropriate requirements (ARARs) or criteria to be considered (TBCs): National Ambient Air Quality Standards (NAAQS), 40 C.F.R. Part 50; National Emissions Standards for Hazardous Air Pollutants (NESHAPs), 40 C.F.R. Part 61, TBC; South Carolina Ambient Air Quality Standards (SC Reg R61-62); and South Carolina Well Standards and Regulations, (R61-71).

Other ARARs for Alternatives 4A and 4B include the Clean Water Act Pretreatment Standards (40 C.F.R. Parts 122, 125, 129, 133, and 136), and depending on the disposal option, South Carolina NPDES Discharge Limitations for treated water (R61-9) if discharge is to a stream and South Carolina No Discharge

Permit Requirements for treated waters (R61) for discharge to infiltration trenches.

The treatment system related to Alternatives 4A and 4B, may produce a sludge, and possibly spent carbon, that may be subject to the identification (40 C.F.R. Part 261, SCHWMR 61-79.261), transportation (40 C.F.R. Part 262, SCHWMR 61-79.262), manifestation (40 C.F.R. Part 263, SCHWMR 61-79.263), and land disposal restriction (40 C.F.R. Part 268, SCHWMR 61-79.268) requirements of the Resource Conservation and Recovery Act (RCRA) 42 U.S.C. §§ 6901 et seq., as amended, if the resulting sludge is determined to be a RCRA hazardous waste.

7.1 Alternative 1: No Action

Under the no action alternative, the Site is left "as is" and no funds are expended for the cleanup or control of the contaminated groundwater. Monitoring of contaminants of concern and their degradation contaminants, not including their innocuous compounds, would be included as part of this alternative. Monitoring of the contaminants would involve the collection and analysis at regular intervals, of groundwater samples from existing Site monitoring wells, as well as surface water samples from previous creek locations, to allow tracking of contaminant concentrations and to monitor the speed, direction, and extent of contaminant migration. The number and location of well and surface water samples will be determined during remedial design. In addition, the need for any additional monitoring wells, which may be sampled for additional contaminants, will be determined during the remedial design/remedial action phases. These wells may be added if it is determined later that groundwater contamination has left the Site property or if further characterization of the Site is needed. Future risks to persons living on and near the Site will remain. Because hazardous contaminants would remain on-site, a Five (5) Year Review would be required under CERCLA.

Capital Cost:	$ 27,000.00
Annual O&M Cost:	116,800.00
Total Present Worth Cost:	$ 1,925,000.00

7.2 Alternative 2: Institutional Controls and Access Restrictions

Under this alternative, institutional controls would be implemented to restrict the withdrawal and use of contaminated groundwater on-site. A second requirement of this alternative will be the monitoring of contaminants, as described in Alternative 1.

The institutional controls would apply to the Rochester Property Site, and include deed restrictions and well permit restrictions. Deed restrictions would prevent future use of the contaminated groundwater for purposes such as potable water supply or irrigation. These restrictions would be written into the property deed to inform future property owners of the possibility of contaminated groundwater beneath the property. Permit restrictions, issued by the State of South Carolina, would restrict all well drilling permits issued for new wells on the Site property that may draw water from the contaminated groundwater.

Capital Cost:	$ 40,000.00
Annual O&M Cost:	116,800.00
Total Present Worth Cost:	$ 1,938,000.00

7.3 Alternative 3: In-Situ Air Sparging

In-situ air sparging would be accomplished by pumping air through gravel-filled trenches, and if required by EPA, wells, in the saturated zone, creating a steady flow of gas, or bubbles, that rise through the aquifer. Air sparging creates a crude form of an air stripper in the subsurface. The rising bubbles contact the dissolved contaminants and allow the TCE to volatilize. In addition to stripping the TCE, the addition of oxygen to the groundwater would promote biodegradation of bis(2-ethylhexyl) phthalate and oxidation of soluble manganese to its more insoluble form. The insoluble manganese would then precipitate and be re-deposited in the soils, where it is already naturally occurring.

At the Site, all TCE contamination has been found in the shallow, water table wells. Therefore, horizontal air sparging trenches would be installed at a depth below the water table. In addition, air sparging wells may also be installed, if it is determined in the remedial design that the air sparging trenches will not reduce the inorganic contaminant to below the performance standard. Following excavation of the trenches, perforated pipe would be laid horizontally in the trenches, and the trenches would be backfilled with gravel. The air would be sparged below the water table, thus reducing the contaminants of concern to below the performance standards. The number and location of trenches required to remediate groundwater will be determined during remedial design. It is possible that only one trench will be required. Also, the need for supplemental air sparging wells to remediate the inorganic contaminant, including the number and locations, would be determined during remedial design.

The vapors would travel through the gravel and through the topsoil layer (if present) to the land surface. Vent pipes or other venting system(s) would be placed through the subsurface to facilitate vapor discharge. The estimated amount of TCE that would volatilize to the atmosphere is extremely low, about 1.5 pounds per year.

In addition to the treatment processes described above, this alternative would include implementation of all of the groundwater monitoring and institutional controls described in Alternatives 1 and 2, thereby ensuring the effectiveness of the alternative and limiting future use of groundwater until the performance standards are continuously achieved.

Capital Cost:	$ 420,000.00
Annual O&M Cost:	156,500.00
Total Present Worth Cost:	$ 2,681,000.00

7.4 Alternatives 4A and 4B: Groundwater Extraction and Treatment

Alternatives 4A and 4B involve placing extraction wells throughout the contaminated groundwater to actively remediate the aquifer. This would also prevent further migration of the contaminated groundwater. It would involve installing extraction wells, removing water from the aquifer, and treating extracted groundwater. The groundwater would be treated to remove inorganic and organic contaminants. In addition to groundwater treatment, institutional controls, as described in Alternative 2, would be implemented to limit current and future use of groundwater until the performance standards are continuously achieved. Also, contaminant monitoring would be performed to monitor the effectiveness of the alternative in achieving the remediation goals, as described in Alternative 1.

The groundwater would be sequentially treated by air stripping to remove the TCE and oxidize the manganese, filtered to remove insoluble manganese, and filtered with activated carbon to remove the bis(2-ethylhexyl)phthalate. If, during future sampling events, it is determined that bis(2-ethylhexyl)phthalate is not present in the groundwater, the carbon filtration portion of the treatment system would be removed.

An air stripping unit works by fostering a controlled evaporation or "stripping" process. The unit has a "tower" or vertical cylinder, filled with a packing media which provides a large surface area for contact between the water and air. The water to be treated is pumped to the top of the tower and cascades downward through the packing media. Air is blown upwards through the bottom of the tower and exits at the top. The high volume of air passing over the thin film of water on the packing evaporates (strips) the volatile organic contaminants from the water. In the process, contaminants are transferred from water to air. The limited volatile emissions (1.5 pounds per year) from the air stripper would not require any additional emissions control system. After treatment, the groundwater extracted from beneath the Site could be piped to a local stream (Alternative 4A). This disposal option may require obtaining, or at least meeting, the substantive requirements of a National Pollution Discharge Elimination System (NPDES) permit. Maintenance of the discharge permit would, at a minimum, require regular effluent monitoring for TCE, bis(2-ethylhexyl)phthalate, and manganese. Alternatively, the treated groundwater could be introduced into a series of reinfiltration trenches (Alternative 4B). These trenches would each contain a perforated PVC pipe embedded in a gravel layer and would be analogous to a septic tank leach field. The length, depth, width, and number of trenches, would be determined during the Remedial Design phase.

Reinfiltration of the treated groundwater would not require any discharge permit. However, implementation of this alternative would require submittal of a Preliminary Engineering Design Report to the State of South Carolina for approval. In addition, this disposal option would, at a minimum, require regular effluent monitoring for TCE, bis(2-ethylhexyl)phthalate, and manganese.

Preliminary groundwater modeling indicates that three (3) to four (4) extraction wells would be needed to recover the contaminated groundwater at a potential yield of approximately two (2) to three (3) gallons per minute (gpm) per well. Given the relatively slow horizontal movement of Site groundwater, this alternative would take longer to reach the remediation goals than Alternative 3, because of the time necessary for the contaminated groundwater to reach the extraction wells. It is estimated to take three (3) to ten (10) years to reach the remediation goals, but it could take longer.

Alternative 4A:	Capital Cost:	$ 520,000.00
	Annual O&M Cost:	201,300.00
	Total Present Worth Cost:	$ 3,071,000.00

Alternative 4B:	Capital Cost:	$ 567,000.00
	Annual O&M Cost:	197,000.00
	Total Present Worth Cost:	$ 3,084,000.00

8.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES FOR GROUNDWATER

The five (5) alternatives for groundwater remediation were evaluated based upon the nine (9) criteria set forth in 40 C.F.R. § 300.430(e)(9) of the NCP. In the sections which follow, brief summaries of how the alternatives were judged against these nine (9) criteria are presented. In addition, the sections are prefaced by brief descriptions of the criteria.

8.1 Groundwater Remediation Alternatives

For ease of reference, the five (5) groundwater remedial alternatives that EPA considered are listed in Table 2.

8.1.1 Threshold Criteria

Two (2) threshold criteria must be achieved by a remedial alternative before it can be selected.

1. Overall protection of human health and the environment addresses whether the alternative will adequately protect human health and the environment from the risks posed by the Site. Included is an assessment of how and whether the risks will be properly eliminated, reduced, or controlled through treatment, engineering controls, and/or institutional controls.

All of the alternatives, with the exception of Alternative 1, No Action, will provide overall protection of human health and the environment. Alternative 2, Institutional Controls/Natural Attenuation, achieves protection from the contaminants by preventing exposure to affected groundwater by establishing deed restrictions prohibiting future uses of groundwater under the Site, and by allowing natural biodegradation to reduce the concentrations of organic contaminants in the affected groundwater. This alternative should also provide protection from the inorganic contaminants.

Alternative 3, In-Situ Air Sparging, utilizes in-situ sparging technology to reduce contaminant concentrations in the ground water and deed restrictions to prohibit future uses of groundwater during the remedial period.

Alternative 4A, Groundwater Extraction, Treatment, and Discharge to a Local Stream, and Alternative 4B Groundwater Extraction, Treatment, and Discharge to Reinfiltration Trenches, will likewise achieve overall protection through extraction and treatment of groundwater.

TABLE 2

**COMPARATIVE ANALYSIS OF ALTERNATIVES
ROCHESTER PROPERTY FEASIBILITY STUDY**

	ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 INSTITUTIONAL CONTROLS	ALTERNATIVE 3 IN-SITU AIR SPARGING	ALTERNATIVE 4A GROUND WATER EXTRACTION, TREATMENT, AND DISCHARGE TO LOCAL STREAM	ALTERNATIVE 4b GROUND WATER EXTRACTION, TREATMENT, AND DISCHARGE TO REINFILTRATION TRENCHES
Description	Assumes no engineered controls to prevent migration or interrupt exposure pathways. The alternative is considered complete at this point.	Establish security fencing and deed restrictions. Allows for natural attenuation.	Install a air sparging trench to enhance volatilization and biodegradation of organics and to increase oxygen level in subsurface to aid in the precipitation of manganese.	Install recovery wells to contain and extract affected ground water. Treat contaminated ground water and discharge under an NPDES permit.	Install recovery wells to contain and extract affected ground water. Treat contaminated ground water and discharge under an No Discharge permit.
Criteria Overall protection of human health and the environment	No change in existing conditions. This alternative is not protective of human health and the environment.	This alternative would minimize exposure to affected ground water and limit exposure pathways. Future exposure concentration available to receptor could be reduced through natural attenuation.	This alternative would minimize exposure to affected ground water and limit exposure pathways from source to receptors. Future exposure concentration available to receptor would be reduced through enhanced volatilization and biodegradation of COCs.	This alternative is overall protective of human health and the environment. This alternative is as protective for organics as Alternative 3, but more protective for inorganics.The short-term risk is slightly elevated due to exposure to contaminants during construction.	This alternative is overall protective of human health and the environment. This alternative is as protective for organics as Alternative 3, but more protective for inorganics.The short-term risk is slightly elevated due to exposure to contaminants during construction.
Compliance with ARARs	Does not comply with ARARs	Will comply with ARARs for organic contaminants in 5-14 years through natural attenuation.	Will comply with ARARs in 4-5 years through volatilization and enhanced biological degradation.	Will meet ARARs through treatment of affected ground water in 3-10 years.	Will meet ARARs through treatment of affected ground water in 3-10 years.
Long-term effectiveness and Permanence	The alternative is considered complete at this time; therefore no long term effectiveness has been achieved. Ground water monitoring will be effective in assessing migration of affected ground water.	Will be effective in reducing organic contaminant concentrations in 5-14 years through natural attenuation.	Will be effective in reducing contaminant concentrations in 4-5 years through volatilization, enhanced biodegradation, and aeration of the subsurface.	Extraction and treatment will reduce affected ground water and be long-term effective. Containment of ground water can be achieved in 1-3 years. Treatment will achieve remediation goals in 3-10 years.	Extraction and treatment will reduce affected ground water and be long-term effective. Containment of ground water can be achieved in 1-3 years. Treatment will achieve remediation goals in 3-10 years.

TABLE 2 (Continued)

COMPARATIVE ANALYSIS OF ALTERNATIVES
ROCHESTER PROPERTY FEASIBILITY STUDY

	ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 INSTITUTIONAL CONTROLS	ALTERNATIVE 3 IN-SITU AIR SPARGING	ALTERNATIVE 4A GROUND WATER EXTRACTION, TREATMENT, AND DISCHARGE TO LOCAL STREAM	ALTERNATIVE 4b GROUND WATER EXTRACTION, TREATMENT, AND DISCHARGE TO REINFILTRATION TRENCHES
Reduction of toxicity, mobility, or volume through treatment	Will not reduce toxicity, mobility or volume.	Will not reduce toxicity and volume through treatment. However, contaminant concentrations will decrease through natural attenuation in 5-14 years.	Will reduce toxicity and volume through volatilization and enhanced degradation in 4-5 years.	Treatment will reduce toxicity and volume of contaminants. Removal of ground water will reduce mobility of contaminants.	Treatment will reduce toxicity and volume of contaminants. Removal of ground water will reduce mobility of contaminants.
Short-term effectiveness	No effect on the environment or on the affected ground.	Will provide the greatest short-term effectiveness, since no construction activities are involved.	Site disturbances are manageable.	Site disturbances are manageable. Mobility in air environment will be slightly increased.	Site disturbances are manageable. Mobility in air environment will be slightly increased.
Implementability	Readily implementable. Some of the monitoring wells have already been installed.	Equal to Alternative 1.	Readily implementable. Design and installation downtime minimal compared to extraction and discharge alternatives	This alternative is readily implementable using existing, proven technologies. Obtaining a NPDES permit may be difficult	This alternative is readily implementable using existing, proven technologies. Obtaining a No Discharge permit may be difficult.
Cost	$ 1.9 million	$ 1.9 million	$ 2.7 million	$ 3.1 million	$ 3.1 million

Future cancer risk through groundwater ingestion will be reduced to less than 1×10^{-6} through natural attenuation of organic contaminants in Alternative 2, through volatilization and enhanced degradation of organic contaminants in Alternative 3, and through extraction and treatment in Alternative 4.

Future noncarcinogenic effects through groundwater ingestion will be reduced to acceptable levels, through oxidation of manganese in Alternative 3, and through extraction and treatment in Alternative 4. Future noncarcinogenic effects through groundwater ingestion should be reduced to acceptable levels in Alternative 2.

2. Compliance with applicable or relevant and appropriate requirements (ARARs) addresses whether an alternative will meet all of the requirements of Federal and State environmental laws and regulations, as well as other laws, and/or justifies a waiver from an ARAR. The specific ARARs which will govern the selected remedy are listed and described in Section 9.0, the Selected Remedy.

The evaluation of the ability of the proposed alternatives to comply with ARARs included a discussion of chemical-specific and action-specific ARARs presented in Section 7. As stated earlier, there are no known location-specific ARARs for the Site. All of the alternatives, with the exception of Alternative 1, No Action, will meet their respective ARARs at the completion of the remedial activities.

8.1.2 Primary Balancing Criteria

Five (5) criteria were used to weigh the strengths and weaknesses of the alternatives, and were used to select one of the five (5) alternatives. Assuming satisfaction of the threshold criteria, these five (5) criteria are EPA's main considerations in selecting an alternative as the remedy.

1. Long term effectiveness and permanence refers to the ability of the alternative to maintain reliable protection of human health and the environment over time, once the remediation goals have been met. Alternative 1, No Action, will not provide long term effectiveness. Alternatives 2, Institutional Controls/ Natural Attenuation, and Alternative 3, In-Situ Air Sparging, achieve permanent reduction in organic contaminants through biological degradation and volatilization, respectively, after which the manganese should be reconverted to an insoluble form. Alternative 3 would increase the oxygen to the subsurface at a much higher rate than Alternative 2, thus attaining remediation levels in a shorter time period.

Alternative 2 is projected to result in groundwater concentrations below remediation goals (MCLs) in five (5) to fourteen (14) years. Alternative 3, In-Situ Air Sparging, is projected to result in groundwater concentrations below remediation goals (MCLs) in four (4) to five (5) years.

Alternative 4, Groundwater Extraction and Treatment, will utilize volatilization, filtration and absorption to remove contaminants from the groundwater, and therefore, be effective in the long-term.

2. Reduction of toxicity, mobility, or volume through treatment addresses the anticipated performance of the treatment technologies that an alternative may employ. The 1986 amendments to CERCLA, the Superfund Amendments and Reauthorization Act (SARA), directs that, when possible, EPA should choose a treatment process that permanently reduces the level of toxicity of Site contaminants, eliminates or reduces their migration away from the Site, and/or reduces their volume on a Site.

Alternative 1, No Action, does not achieve a reduction in the toxicity, mobility, or volume of the contaminants since the alternative is considered complete at this time.

Alternative 2, Institutional Controls/Natural Attenuation, is not a treatment technology and, therefore, does not satisfy the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce the toxicity, mobility, or volume of the contaminants. However, the organic concentrations will decrease in five (5) to fourteen (14) years, after which the manganese should be reconverted to an insoluble form.

Alternatives 3, In-Situ Air Sparging, and Alternative 4, Groundwater Extraction and Treatment, use active treatment technologies to reduce the toxicity, mobility, and volume of the contaminated groundwater. Reduction of organic contaminant concentrations in the groundwater can be achieved by Alternative 3 through enhanced biodegradation and in-situ volatilization of the contaminants in an estimated four (4) to five (5) years. This alternative is expected to reduce the concentration of manganese in the groundwater following return of the aquifer to background conditions through active reoxidation and precipitation.

Alternative 4, Groundwater Extraction and Treatment, will likewise achieve a permanent reduction of the concentrations of contaminants in the groundwater through the above ground treatment schemes within an estimated three (3) to ten (10) year operation period. Containment of the contaminated groundwater should be achieved in one (1) to three (3) years.

3. Short-term effectiveness refers to the potential for adverse effects to human health or the environment posed by implementation of the remedy.

Of the alternatives that achieve ARARs, Alternative 2, Institutional Controls, affords the greatest level of short-term protection because it presents the least risk to remedial workers, the community, and the environment. The other alternatives could release minimal volatile emissions during excavation and/or treatment system construction. Standard construction management techniques should address any potential short-term fugitive emissions.

Since there is no current risk at the Site posed by direct contact and/or ingestion of surface soils, the time frame to achieve short-term protectiveness is shorter for those alternatives that do not involve invasive techniques. Field implementation of Alternative 3, In-Situ Air Sparging, is expected to take three (3) months. Field implementation of Alternative 4, Groundwater Extraction and Treatment is expected to take six (6) months.

4. Implementability considers the technical and administrative feasibility of an alternative, including the availability of materials and services necessary for implementation.

Of the alternatives that will comply with ARARs, Alternative 2, Institutional Controls, will be the easiest to implement since it does not involve the construction of a treatment system.

The construction technologies required to implement Alternative 3, In-Situ Air Sparging, are comparable with standard trenching and well installation activities. The air sparging system has additional operational requirements compared to Alternative 2 because of the air supply system.

The construction technologies required to implement Alternative 4, Groundwater Extraction and Treatment, are well established and very reliable. The extraction and treatment systems will have additional operational requirements compared to Alternatives 1, 2, and 3, because of the complexities of a continuous operation of a groundwater extraction system, the operation of a multi-component treatment system, and requisite discharge limits on the resulting treated effluent. The extraction and treatment system is more difficult to operate and maintain than options proposed under Alternative 2 and Alternative 3.

The technical implementability of all the evaluated alternatives is reasonable. Technologies required to implement the alternatives are readily available and proven at full-scale in similar field efforts. Obtaining discharge permits are a prerequisite for the implementation of Alternative 4, if discharge is to the creek.

5. Cost includes both the capital (investment) costs to implement an alternative, plus the long-term O&M expenditures applied over a projected period of operation. The total present worth cost for each of the four alternatives is presented in Table 3, and in Section 7.

8.1.3 Modifying Criteria

State acceptance and community acceptance are two (2) additional criteria that are considered in selecting a remedy, once public comment has been received on the Proposed Plan.

1. State acceptance: The State of South Carolina concurs with this remedy. South Carolina's letter of concurrence is provided in Appendix B to this ROD.

2. Community acceptance was indicated by the verbal comments received at the Rochester Property Site Proposed Plan public meeting, held on June 28, 1993. The public comment period opened on June 14, 1993, and closed on August 13, 1993 (after a 30-day extension). Written comments received concerning the Site, and those comments expressed at the public meeting, are addressed in the Responsiveness Summary attached as Appendix A to this ROD.

9.0 THE SELECTED REMEDY

9.1 Groundwater Remediation

Based upon consideration of the requirements of CERCLA, the NCP, the detailed analysis of the five (5) alternatives and public and state comments, EPA has selected a remedy that addresses groundwater contamination at this Site. At the completion of this remedy, the risk remaining at this Site will be 1×10^{-6}, and HI less than 1, which is considered protective of human health and the environment.

The selected remedy for the Site is:

Alternative 3, In-Situ Air Sparging

Total present worth cost of the selected remedy is:

$ 2,681,000.00.

This remedy consists of in-situ air sparging of contaminated groundwater. The following subsections describe this remedy component in detail, provide the criteria (ARARs and TBC material) which shall apply, and establish the performance standards for implementation.

9.1.1 Description

This remedy component consists of the design, construction and operation of an in-situ air sparging system, and development and implementation of a Site monitoring plan to monitor the system's performance. The groundwater treatment specified below shall be continued until the performance standards listed in Section 9.1.3. are achieved, at a minimum, in all of the monitoring wells that are associated with the Site.

In-situ air sparging will be accomplished by pumping air, through trenches and, possibly wells, in the saturated zone, creating a steady flow of gas, or bubbles, that rise through the aquifer. The rising bubbles contact the dissolved contaminants and allow the TCE to volatilize. In addition to stripping the TCE, the addition of air (containing oxygen) to the groundwater will promote biodegradation of bis(2-ethylhexyl)phthalate and oxidation of soluble manganese to its more insoluble form. The insoluble manganese will then precipitate and be re-deposited in the soils, where it is already naturally occurring. Treatability studies (bench and/or pilot) will be conducted, if determined to be necessary during Remedial Design.

Horizontal air sparging trenches (and possibly wells) would be installed at a depth below the water table. The vertical extent of groundwater contamination will be confirmed and updated during the Remedial Design. Following excavation of the trenches, perforated pipe would be laid horizontally in the trenches, and the trenches would be backfilled with gravel. The air would be sparged below the water table, thus reducing the contaminants of concern to below the performance standards. The number and location of trenches required to remediate groundwater will be determined during remedial design. It is possible that only one trench will be required. Also the need for supplemental air sparging wells to remediate the inorganic contaminant, including the number and locations, will be determined during remedial design.

The vapors would travel through the gravel and through the topsoil layer (if present) to the land surface. Vent pipes or other venting system(s) will be placed through the subsurface to facilitate vapor discharge. The estimated amount of TCE that would volatilize to the atmosphere is extremely low, about 1.5 pounds per year.

In addition to the treatment processes described above, this alternative will include implementation of all of the institutional controls and contaminant monitoring requirements described in Alternatives 1 and 2, thereby monitoring the effectiveness of the alternative and limiting future use of groundwater until clean-up goals are achieved.

The institutional controls would apply to the Rochester Property Site, and include deed restrictions and well permit restrictions. Deed restrictions would prevent future use of the contaminated groundwater for purposes such as potable water supply or irrigation. These restrictions would be written into the property deed to inform future property owners of the possibility of contaminated groundwater beneath the property. Permit restrictions, issued by the State of South Carolina, would restrict all well drilling permits issued for new wells on the Site property that may draw water from the contaminated groundwater. Institutional controls will also include a fence, or other suitable method subject to EPA approval, surrounding the previous disposal trenches and all in-situ air sparging operations, including the trenches, wells, and equipment.

Monitoring of contaminants of concern and their degradation contaminants, not including their innocuous compounds, would be included as part of this alternative. Monitoring of the contaminants would involve the collection and analysis at regular intervals, of groundwater samples from existing Site monitoring wells, as well as surface water samples from previous creek locations, to allow tracking of contaminant concentrations and to monitor the speed, direction, and extent of contaminant migration. The number and location of well and surface water samples will be determined during remedial design. In addition, the need for any additional monitoring wells, which may be sampled for additional contaminants, will be determined during the remedial design/remedial action phases. These wells may be added if it is determined later that groundwater contamination has left the Site property or if further characterization of the Site is needed.

Air monitoring, both on-site and at the periphery, which may involve continuous real-time air monitoring, will be performed, during Remedial Action.

The goal of this remedial action is to restore groundwater to its beneficial use as a drinking water source. Based on the information collected during the RI and on a careful analysis of all remedial alternatives, EPA and the State of South Carolina believe that the selected groundwater remedy will achieve this goal.

If it is determined, on the basis of the preceding criteria and the system performance data, that certain portions of the aquifer cannot be restored to their beneficial use, all or some of the following measures involving long-term management may occur, for an indefinite period of time, as a modification of the existing system:

* engineering controls such as physical barriers as containment measures;
* chemical-specific ARARs will be waived for the cleanup of those portions of the aquifer based on the technical impracticability of achieving further contaminant reduction;
* institutional controls will be provided/maintained to restrict access to those portions of the aquifer that remain above remediation goals;
* continued monitoring of specified wells and surface water locations; and
* periodic re-evaluation of remedial technologies for groundwater restoration.

The decision to invoke any or all of these measures may be made during a review of the remedial action, which will occur minimally at five (5) year intervals in accordance with Section 121(c) of CERCLA, 42 U.S.C. § 9621(c).

<u>9.1.2 Applicable or Relevant and Appropriate Requirements (ARARs)</u>

<u>Applicable Requirements.</u> Groundwater remediation shall comply with all applicable portions of the following Federal and State of South Carolina regulations:

SC Reg. 61-62, South Carolina Air Pollution Control Regulations and Standards, promulgated pursuant to the Pollution Control Act, SC Code of Laws, 1976, as amended. Establishes limits for emissions of hazardous air pollutants and particulate matter, and establishes acceptable ambient air quality standards within South Carolina.

SC Reg. 61-68, South Carolina Water Classifications and Standards, promulgated pursuant to the Pollution Control Act, SC Code of Laws, 1976, as amended. These regulations establish classifications for water use, and set numerical standards for protecting state waters.

SC Reg. 61-71, South Carolina Well Standards and Regulations, promulgated under to the Safe Drinking Water Act, SC Code of Laws, 1976, as amended. Standards for well construction, location and abandonment are established for remedial work at environmental or hazardous waste sites.

Relevant and Appropriate Requirements. The following regulations are relevant to groundwater remediation at the Site.

40 C.F.R. Parts 141-143, National Primary and Secondary Drinking Water Standards, promulgated under the authority of the Clean Water Act. These regulations establish acceptable maximum levels of numerous substances in public drinking water supplies, whether publicly owned or from other sources such as groundwater. Maximum Contaminant Levels (MCLs) are specifically identified in 40 C.F.R. § 300.430(a)(1)(ii)(F) of the NCP as remedial action objectives for ground waters that are current or potential sources of drinking water supply. Therefore, MCLs are relevant and appropriate as criteria for groundwater remediation at this Site.

40 C.F.R. Part 61, promulgated under the authority of the Clean Air Act. These are the National Emissions Standards for Hazardous Air Pollutants (NESHAPs). Standards for emissions to the atmosphere fall under these regulations.

SC Reg. 61-58, South Carolina Primary Drinking Water Regulations, promulgated pursuant to the Safe Drinking Water Act, SC Code of Laws, 1976, as amended. These regulations are similar to the federal regulations described above, and are relevant and appropriate as remediation criteria for the same reasons set forth above.

Criteria "To Be Considered" (TBC) and Other Guidance. As noted above in Section 9.1.2, TBC criteria were utilized and/or established in the Baseline Risk Assessment and in the FS. Groundwater cleanup standards were established based on these documents and both are thus considered TBC.

In the Baseline Risk Assessment, TBC material used included information concerning toxicity of, and exposure to, Site contaminants. Sources of such data included the Integrated Risk

Information System (IRIS), Health Effects Assessment Summary Tables (HEAST), and EPA guidance as specified in the Baseline Risk Assessment.

In the FS, groundwater concentrations protective of human health and the environment were calculated based on the Site-specific risk calculations from the Baseline Risk Assessment. Certain of these levels were established as remediation goals in cases where there is no MCL for a particular contaminant. Specific contaminants for which health-based goals were established were for manganese. The groundwater remediation goals are established as performance standards in the Section 9.1.3.

Other TBC material include the following:

Guidelines for Groundwater Use and Classification, EPA Groundwater Protection Strategy, U.S. EPA, 1986. This document outlines EPA's policy of considering a site's groundwater classification in evaluating possible remedial response actions.

As described under Section 1.4, the groundwater at the Site is classified by EPA as Class IIB and by South Carolina as Class GB groundwater, indicating its potential as a source of drinking water.

40 C.F.R. Part 50, National Ambient Air Quality Standards (NAAQS), promulgated under the authority of the Clean Air Act. This regulation includes the National Ambient Air Quality Standards (NAAQS), and establishes a national baseline of ambient air quality levels. The state regulation which implements this regulation, South Carolina Reg. 62-61, is applicable to the groundwater portion of the remedy.

Other requirements. As described above in Section 9.1.2, remedial design often includes the discovery and use of unforeseeable but necessary requirements. Therefore, during design of the groundwater component of the selected remedy, EPA may, through a formal ROD modification process such as an Explanation of Significant Differences or a ROD Amendment, elect to designate further ARARs which apply, or are relevant and appropriate, to groundwater remediation at this Site.

9.1.3 Performance Standards

The standards outlined in this section comprise the performance standards defining successful implementation of this portion of the remedy. The groundwater remediation goals in Table 3 below shall be the performance standards for groundwater treatment.

TABLE 3
REMEDIATION LEVELS (Rls) FOR GROUNDWATER AT THE SITE

	CHEMICAL OCCURRENCE		CONCENTRATION RANGE (ppm)	Rls (ppm)	MCL (ppm)	RISK/HI
	NUMBER OF DETECTIONS	NUMBER OF SAMPLES				
Manganese	25	32	ND - 1.390	0.180	0.05[a]	<1.0
Trichloroethene	9	32	ND - 0.180	0.005	0.005	10^{-5}
Bis(2-ethylhexyl) phthalate	3	32	ND - 0.033	0.006	0.006	10^{-6}

KEY
a = Secondary MCL (not health based)
ND = Non Detect

9.2 Monitor Site Groundwater and Surface Water

Groundwater and surface water samples shall be collected and analyzed on a regular schedule to be determined by EPA in the Remedial Design phases. Analytical parameters for groundwater and surface water samples will include the known Site contaminants of concern (COCs), unless the COCs are no longer present or are below the remediation levels consistently. Specific wells and surface water locations to be sampled will be determined during the Remedial Design. The analytical data generated will be used to track the concentrations and movement of groundwater contaminants.

10.0 STATUTORY DETERMINATIONS

The selected remedy for this Site meets the statutory requirements set forth at Section 121(b)(1) of CERCLA, 42 U.S.C. § 9621(b)(1). This section states that the remedy must protect human health and the environment; meet ARARs (unless waived); be cost-effective; use permanent solutions, and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and finally, wherever feasible, employ treatment to reduce the toxicity, mobility or volume of the contaminants. The following sections discuss how the remedy fulfills these requirements.

Protection of human health and the environment: The groundwater remediation alternative will volatilize the TCE, add oxygen to the groundwater to biodegrade the bis(2-ethylhexyl)phthalate, and oxidize the soluble manganese into its more insoluble form, thereby reducing and eventually removing the future risks to human health which could result from ingestion of the groundwater.

Compliance with ARARs: The selected remedy will meet ARARs, which are listed in Sections 9.1.2 of this ROD.

Cost effectiveness: Among the groundwater alternatives that are protective of human health and the environment and comply with all ARARs, the selected alternative is the most cost-effective choice because it uses a treatment technology to remediate the contamination in basically the shortest time frame, at a cost similar to the other alternatives.

Utilization of permanent solutions, and alternative treatment technologies or resource recovery technologies to the maximum extent practicable: The selected remedy represents the use of treatment for a permanent solution. Among the alternatives that are protective of human health and the environment and comply with all ARARs, EPA and the State of South Carolina have determined that the selected remedy achieves the best balance of trade-offs in terms of long-term effectiveness and permanence, reduction of toxicity/mobility/volume, short-term effectiveness, implementability, and cost. The selected groundwater action is more readily implementable than the other alternatives considered. Preference for treatment as a principal remedy element: The proposed groundwater remediation alternative will fulfill the preference for treatment as a principal element.

APPENDIX A

RESPONSIVENESS SUMMARY

ROCHESTER PROPERTY SUPERFUND SITE

ROCHESTER PROPERTY SUPERFUND SITE

1. Overview

The U. S. Environmental Protection Agency (EPA) held a public comment period from June 14, 1993 to July 14, 1993, for interested parties to comment on the Remedial Investigation/ Feasibility Study (RI/FS) results and the Proposed Plan for the Rochester Property Superfund Site in Travelers Rest, South Carolina. Upon receipt of a request, the comment period was extended an additional 30 days. The comment period closed on August 13, 1993.

EPA held a public meeting at 7:00 p.m. on June 28, 1993, at the Traveler's Rest City Hall in Traveler's Rest, South Carolina to present the results of the RI/FS and the Baseline Risk Assessment, to present the Proposed Plan and to receive comments from the public.

EPA proposed a remedy consisting of in-situ air sparging for treatment of contaminated groundwater. Judging from the comments received during the public comment period, the residents and local officials in the Travelers Rest, South Carolina, area support the cleanup alternative proposed by EPA.

The Responsiveness Summary provides a summary of citizens' comments and concerns identified and received during the public comment period, and EPA's response to those comments and concerns. These sections and attachments follow:

- Background of Community Involvement
- Summary of Comments Received During the Public Comment Period and EPA's Responses
- Attachment A: Proposed Plan for Rochester Property Superfund Site
- Attachment B: Public Notices of Public Comment Period & Extension of Public Comment Period
- Attachment C: Written Public Comments Received During the Public Comment Period
- Attachment D: Proposed Plan Public Meeting Sign In Sheets
- Attachment E: Official Transcript of the Proposed Plan Public Meeting

2. Background of Community Involvement

EPA's community relations program for the Site began in May 1992, when EPA conducted community interviews in order to develop a community relations plan for the Site. At that time, residents living adjacent to the Site were not concerned about the Site or about any health risks from the Site. They did voice some concerns about lack of information to the public during the removal work at the Site.

Throughout EPA's involvement, the community has been kept aware and informed of Site activities and findings. Discussions have taken place during visits to the area by the Remedial Project Manager (RPM) during the two phases of the RI. Local officials were briefed during the community interviews, but were not very interested in the Site. The Site mailing list was expanded to include additional residents living in close proximity to the Site.

In December 1992, discussions were held with some adjacent property owners on the RI findings to date, and to explain the planned additional groundwater sampling. The residents did not seem to have concerns about the Site.

3. Summary of Comments Received During the Public Comment Period and Agency Responses

The Public Comment Period was opened on June 14, 1993, and ended on July 14, 1993. Upon request, a 30-day extension was granted, which extended the comment period to August 13, 1993. Public Notices which were published in local papers can be found in Attachment B.

On June 28, 1993, EPA held a public meeting to present the Proposed Plan to the community and to receive comments. All comments received at this public meeting and during the public comment period are summarized below.

Summary and Response to Local Community Concerns

The following issues and concerns were expressed at the Proposed Plan Public Meeting, and during the public comment period.

COMMENT: Several attendees asked if there were any plans to monitor the Site, including after the remedy is instituted and how often the wells would be sampled and that one week it could be "good" but not be in two days.

RESPONSE: EPA will monitor the Site prior to, and after the remedy is instituted. The frequency of the monitoring will be determined at a later date. With the contamination levels present at this Site, and with the speed at which the contamination is moving, it would not be necessary to sample once a week or so, but quarterly, semi-annual, or even annual sampling would provide adequate protection. Also, EPA stated at the public meeting that the health effects of contaminants are normally found to be a problem over a long period of exposure.

COMMENT: An attendee claimed during the proposed plan meeting that his home was within 100 feet of the Site. He was concerned that his private well might be contaminated, and asked to have his well tested. In addition, many attendees at the proposed plan meeting were also concerned because they were not clear as to the location of the contamination in relation to their property.

RESPONSE: EPA obtained a copy of the tax map for the area and determined that the attendee's property is located approximately 650 feet upgradient from the Site. Based upon the direction of Site groundwater flow, the attendee's private well is not threatened by the contamination present at the Site. The groundwater beneath the Site is flowing in a northeasterly direction, while the attendee's private well is located west of the Site.

In addition, private wells located closest to the Site (including upgradient) were sampled in the past, and no contaminants were detected. Therefore, EPA has determined that there is no need for testing of the attendee's well located approximately 650 feet upgradient.

EPA mailed copies of the tax map of the area to everyone who listed a complete address on the sign-in sheet at the proposed plan meeting. The tax map shows the Site and surrounding property, and contains a distance scale in order to determine the distance between the nearby properties and the Site.

COMMENT: An attendee asked if the PRP was amenable to EPA's proposed alternative, and whether EPA had to "sell" the PRP on the alternative.

RESPONSE: EPA stated at the public meeting that yes, the PRP was agreeable to the proposed alternative, but regardless of whether or not the PRP agreed with the proposed alternative, EPA makes the decision based on whether the treatment is overall protective of human health and the environment, and that it was not a matter of "selling" the idea to the PRP.

COMMENT: Various attendees at the public meeting expressed concern over the problems associated with the perception of owning property near a Superfund site. In addition, EPA received one written comment from a local resident who, along with the attendees at the public meeting, wanted to know if EPA would require the PRP to install monitoring wells on all of the adjacent properties. The attendees felt that this would provide, as one property owner stated, a "certificate of some kind at the end of it saying these tests were done and came up clean on our property." Some attendees were concerned that their property may be contaminated. The attendees wanted some kind of compensation for damages associated with the perception of owning property near a Superfund site.

RESPONSE: EPA explained during the public meeting that based upon sampling done at the Site, there was no unacceptable current risk, and that the only risk at the Site was a potential future risk to a future on-site resident that installed a private well. EPA also stated that it did not have the authority to "certify" that the adjacent properties were "clean", or the authority to provide compensation for potential damages from the stigma of owning property near a Superfund site.

COMMENT: A written comment stated that institutional controls should only apply to the on-site property since the groundwater plume had not left the site boundary. The comment stated that results in the RI showed that the organic contaminants were found above the cleanup levels in only the first line of monitoring wells.

RESPONSE: EPA agrees with the basic intent of the comment in that deed restrictions on off-site property do not appear to be necessary at this time. Groundwater data results from the RI suggest that groundwater contamination has not left the property boundaries, therefore deed restrictions and well permit restrictions need only be applied to the Rochester Property Site at this time. However, if EPA discovers that groundwater contamination has left the property boundaries, and poses a threat to human health or the environment, EPA reserves the right to amend the ROD to require deed restrictions or other institutional controls on affected off-site properties. Even though EPA agrees with the intent of the comment, EPA does not agree with all details stated in the comment. This at least applies to the statement that "the ground water samples collected during the Remedial Investigation demonstrate that the contaminated ground water plume is contained within the Rochester property boundaries." It has not been conclusively demonstrated that groundwater contamination has been confined on-site, although that is the most reasonable interpretation of the data currently available.

COMMENT: A written comment stated that additional monitoring wells should not be required. The comment stated that results in the RI showed that the organic contaminants were found above the cleanup levels in only the first line of monitoring wells. The comment also stated that the air sparging trench will likely be located between the two lines of monitoring wells, thus intercepting the contaminants before they reach the second line of wells.

RESPONSE: Although the comment that organic contaminants were detected in only the first line of monitoring wells above cleanup standards is correct, the ROD also addresses an inorganic contaminant. This contaminant was detected in the second line of monitoring wells. In addition, the location and number of air sparging trenches and wells will be determined during remedial design. Therefore the need for additional monitoring wells will also be determined during remedial design.

COMMENT: A written comment stated that nitrogen should not be the gas used, but ambient air.

RESPONSE: EPA agrees with the comment that for this Site air should be the gas used for air sparging, since oxygen is needed to reach cleanup levels for some of the contaminants.

COMMENT: A written comment stated that deep air sparging wells should not be required since the inorganic contaminant did not correlate with the locations of the organic contaminants.

RESPONSE: Whether or not there is a correlation between the organic contaminants and the inorganic contaminant, EPA has to protect human health and the environment. Therefore, since there is an inorganic contaminant at the Rochester Property Site, EPA may required deep air sparging wells. This will be determined during the remedial design.

Attachment A

Proposed Plan for Rochester Property Superfund Site

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SUPERFUND PROPOSED PLAN FACT SHEET

ROCHESTER PROPERTY SUPERFUND SITE

Travelers Rest, Greenville County, South Carolina **June 1993**

This fact sheet is one in a series designed to inform residents and local officials of the ongoing cleanup efforts at the Site. A number of terms specific to the Superfund process (printed in *bold* print are defined in the glossary at the end of this publication.

INTRODUCTION

The United States Environmental Protection Agency (EPA), is proposing a cleanup plan, referred to as the preferred alternative, to address contaminated ***groundwater*** at the Rochester Property Superfund Site (the Site) located in Traveler's Rest, Greenville County, South Carolina. This document is being issued by EPA, the lead agency for Site activities, and the South Carolina Department of Health and Environmental Control (SCDHEC), the support agency. SCDHEC has reviewed EPA's preferred alternative and concurs with EPA's recommendation.

This Proposed Plan summarizes the cleanup methods/technologies evaluated in the ***Feasibility Study (FS).*** In accordance with Section 117(a) of the ***Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments Reauthorization Act of 1986, (CERCLA, known as Superfund),*** EPA is publishing this Proposed Plan to provide an opportunity for public review and comment on all cleanup options (known as remedial alternatives) under consideration for the Site, as developed in the Feasibility Study, including EPA's preferred alternative, EPA is initiating a thirty (30) day ***public comment period*** from June 14 to July 14, to receive comments on this Proposed Plan and the RI/FS Reports. EPA, in consultation with SCDHEC, will select a remedy for the Site only after the public comment period has ended and all information submitted to

PROPOSED PLAN PUBLIC MEETING
for the
ROCHESTER PROPERTY SUPERFUND SITE
June 28, 1993 - 7:00 P.M.
TRAVELERS REST CITY HALL
Council Chambers
160 State Park Road
Travelers Rest, South Carolina

EPA during that time has been reviewed and considered. As outlined in section 117(a) of CERCLA, EPA encourages public participation by publishing Proposed Plans for addressing contamination at Superfund sites, and by providing an opportunity for the public to comment on the proposed remedial actions. As a result of such comments, EPA may modify or change its preferred alternative before issuing a ***Record of Decision*** for the Site. This process is explained in more detail in the Public Participation section of this document on which begins on page 13.

EPA's preferred alternative for cleanup of Site groundwater is: In-Situ Air Sparging. This alternatives achieves the best balance of trade-offs among the criteria EPA uses to evaluate remedial alternatives. The selection of a cleanup plan, or "preferred alternative," represents a preliminary decision by EPA, subject to a public comment period. The preferred alternative for groundwater, as well as the others considered, are summarized in this fact sheet and presented more fully in the Feasibility Study (FS).

Scope and Role of this Action. The Site poses a potential future risk due to contaminants in the groundwater. EPA's plan for remediation of the Rochester Site will address all threats posed by the contaminated groundwater.

This fact sheet summarizes information that is explained in greater detail in the ***Remedial Investigation (RI)*** Report, dated April 1993, and the ***Baseline Risk Assessment*** document (included in the RI), dated April 1993, and the FS, dated May 1993. These documents and all other records utilized by EPA to make the proposal specified below are contained in the **administrative record** for this Site. EPA and SCDHEC encourage the public to review this information, especially during the public comment period, to better understand the Site, the Superfund process, and the intent of this Proposed Plan. The administrative record is available for public review during normal working hours, locally at the site **information repository**, which is the Traveler's Rest Library or in the Record Center at EPA, Region IV's office in Atlanta, Georgia.

THIS PROPOSED PLAN:

1. Includes a brief history of the Site, the principle findings of the RI and a summary of the Baseline Risk Assessment;

2. Presents the cleanup alternatives considered by EPA for the Site;

3. Outlines the criteria used by EPA to recommend an alternative for use at the Site;

4. Provides a summary of the analysis of alternatives;

5. Presents EPA's rationale for its preliminary selection of the preferred alternative; and

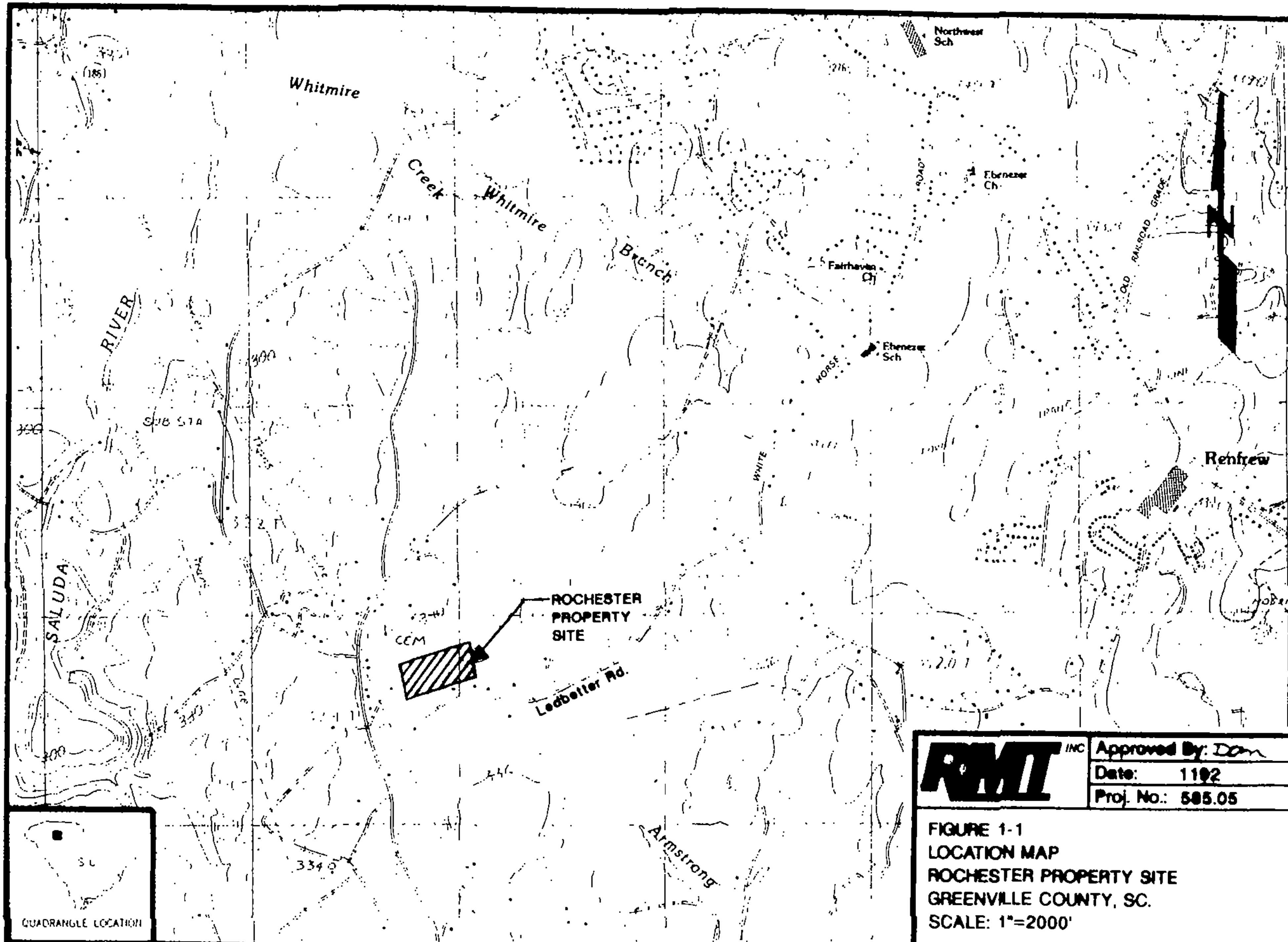
6. Explains the opportunities for the public to comment on the remedial alternatives, and hence the cleanup of the Rochester Property Superfund Site.

SITE BACKGROUND

<u>Site Description.</u> The Rochester Property Site, is located west of the town of Travelers Rest, in Greenville County, South Carolina, and lies in a rural, sparsely populated area (Figure 1). The Site property consists of approximately 4.5 acres, but the area where waste was disposed, and later removed, is located inside a 0.6 acre fenced area. The Site is also located approximately 300 feet north of County Road 268 (also known as Ledbetter Road) and approximately one-quarter mile east of County Road 102. The northern portion of the Site is a pine and deciduous forest while the southern portion was formerly a field which has been planted with pine trees.

The Site is located on a hill between two (2) small streams. An unnamed tributary to Armstrong Creek borders the Site to the north and east and flows to the east. Another small stream borders the Site to the south. This stream flows eastward and discharges into the unnamed tributary to Armstrong Creek about 400 feet east of the Site. Site surface elevations range from 1010 feet above mean sea level (MSL) at the east end of the site to 1047 feet above MSL at the west end of the Site.

<u>Site History.</u> The Rochester Property Site was used for disposal of wastes which are thought to include wood glue, print binders, powder materials, natural guar gums, adhesive for food packages and adhesive restick for envelopes. The waste materials were placed in four (4) separate trenches sometime between late 1971 and early 1972. Each of the four (4) trenches had dimensions of approximately forty (40) feet long, three (3) feet wide and ten (10) feet deep. Previous investigations at the Site began in June 1984, when SCDHEC conducted initial sampling. Subsequently, on November 8, 1984, SCDHEC performed a site inspection. As part of the site inspection, SCDHEC sampled the waste, soils, surface water, and groundwater in the area. Additional investigations were performed in August 1987 and February 1988 by the potentially responsible parties' (PRPs') consultant and by NUS Corporation, EPA's contractor, in June 1988. Based on the analysis of the waste collected by SCDHEC, EPA ranked the Site and included it on the National Priorities List Proposed Update in the Federal Register, Vol. 51, No. 111, on Tuesday, June 10, 1986. The Site was added to the ***National Priorities List*** on October 4, 1989. The buried waste was excavated in January 1990 and disposed of off-site at a secure hazardous waste landfill.



RMT INC

Approved By:	DOM
Date:	1192
Proj. No.:	585.05

FIGURE 1-1
LOCATION MAP
ROCHESTER PROPERTY SITE
GREENVILLE COUNTY, SC.
SCALE: 1"=2000'

RESULTS OF THE REMEDIAL INVESTIGATION

The RI investigated the nature and extent of contamination on and near the Site, and defined the potential risks to human health and the environment posed by the Site. A total of forty-three (43) soil, twenty-nine (29) groundwater, eleven (11) surface water, and five (5) sediment samples were collected. More detailed information can be found in the RI and FS reports, and in the Baseline Risk Assessment.

Groundwater Contamination. Three contaminants of concern, trichloroethene (TCE), bis(2-ethylhexyl) phthalate, and manganese, were detected in the groundwater in the saprolite aquifer. Levels of the TCE ranged from the detection limit (normally 0.010 mg/l) to 0.180 mg/l. TCE concentrations, detected during all the sampling events in 3 of the 13 wells, violate the ***Maximum Contaminant Level*** (MCL) for this contaminant in only 2 of the wells. These wells are located onsite approximately 30 to 50 feet from the previous trenches. Bis(2-ethylhexyl) phthalate was detected in two wells during the first sampling event; 0.033 mg/l (though the duplicate sample was 0.013 mg/l) in one well and 0.013 mg/l in the other well. During the second sampling event, bis(2-ethylhexyl) phthalate was detected in only one well at 0.009 mg/l. It was not detected in any wells during the third sampling event, and was detected in the blanks for all the sampling events. The MCL for bis(2-ethylhexyl) phthalate slightly exceeded in only 2 of 13 wells. Manganese levels ranged from the detection limit to 1.39 mg/l, and exceeded the risk number, that was derived in the Baseline Risk Assessment, in only 5 of 13 wells.

Surface Water Contamination. Samples from the unnamed creek, northeast of the Site, showed TCE at 0.016 mg/l at one location, and 0.005 mg/l at a second location. Extremely low levels of two (2) other ***volatile organic compounds (VOCs)***, below 0.005 mg/l, were detected in one location each. The TCE level is far below the Federal Surface Water Criteria (21.9 mg/l). No other types of contaminants were detected in the creeks.

Soil and Sediment Contamination. Insignificant levels of various substances were detected in the surface soil and sediment samples. The Baseline Risk Assessment determined that there was no current or future risk from the compounds detected in these media, since the levels did not exceed background levels for the inorganics and were primarily below 0.5 mg/l for the organics.

Summary of Site Risks. The Baseline Risk Assessment describes the risks to human health and the environment which would result if the contamination present at the Site is not cleaned up. The assessment proceeds in a series of steps. First, a list is generated of all the chemicals present, and their concentrations. Next, the Assessment considers the present and future population living on the Site (in this case, there are no current residents living onsite), plus visitors to the Site (nonresidents). Then, from the present use of the Site and likely future use scenarios, "pathways" through which persons could be exposed to the contaminants, are developed. The only exposure pathway present at the Site consists of exposure through ingestion of the contaminated groundwater.

The pathways of exposure can be developed by making assumptions such as the length and number of times exposed, how much of the chemical is ingested, as well as other factors. Thus, a calculation can be made using known effects and reasonable exposure assumptions, and the health effects caused by the contaminant. For each pathway, two (2) calculations are made to account for the two (2) general types of contaminants: ***carcinogens***, which are suspected or known to cause cancer, and ***noncarcinogens***, substances which are hazardous and cause other adverse effects to human health.

For carcinogens, the result is expressed as the excess cancer risk posed by Site contaminants. EPA has established a range of 1×10^{-4} to 1×10^{-6} as acceptable limits for lifetime excess carcinogenic risks. Excess risk in this range means that one person in 10,000 (1×10^{-4}) to one person in one million (1×10^{-6}) will risk developing cancer after a lifetime of exposure. For each pathway, the cancer risk from each individual contaminant is added together, because in a reasonable maximum exposure scenario a person could be exposed through several or all of the possible pathways. Noncarcinogenic risk is expressed as a Hazard Index. The Hazard Index (HI) is the ratio of the amount of the chemical taken in, divided by the reference dose, an intake amount below which no adverse effects are known to occur. EPA has established an acceptable level as a HI less than 1. As for cancer risk for each pathway, the HI value for the individual contaminants are added together. <u>For exposure to groundwater, the assumptions made for these calculations are a person drinking two (2) liters (slightly less than two (2) quarts) of water per day, for seventy (70) years.</u>

Carcinogenic risk and noncarcinogenic HI values were calculated for both the current land use scenario, with residents near the Site, and the anticipated future land use scenario, which is residential use. The Baseline Risk Assessment determined that the total cancer risk (using Reasonable Maximum Exposure) for the *current* residential scenario was less than 1×10^{-6}; therefore, the Site does not pose an unacceptable cancer risk under the current exposure scenario. The total HI for the *current* resident was 0.038. This HI is well below the 1 value level of concern for noncarcinogens and indicates that the Site does not pose an unacceptable non-carcinogenic risk under the current exposure scenario evaluated in the Baseline Risk Assessment. <u>Therefore, in summary, the Site does **not** pose a *current* risk.</u>

The Baseline Risk Assessment also determined that the total cancer risk for the *future* residential scenario was 6.8×10^{-5}; this risk level is within the EPA acceptable risk range (1×10^{-4} to 1×10^{-6}). However, EPA may decide that a baseline risk level less than 10^{-4} (i.e., a risk between 10^{-4} and 10^{-6}) is unacceptable due to Site-specific conditions, and that remedial action is warranted. For this Site, EPA believes Remedial Action is warranted, since the future land use will probably be residential, and because MCLs were exceeded for organic contaminants. The HI for the *future* residential scenario was 8.9 for an adult. This level exceeds the acceptable HI of 1.0. The majority of the non-carcinogenic risk is attributable to ingestion of manganese in the groundwater.

More detailed information concerning Site risks is presented in the Baseline Risk Assessment, which is a part of the Remedial Investigation Report, and is available at the public information repository.

REMEDIAL ACTION OBJECTIVES AND ALTERNATIVES

<u>Remedial Action Objectives.</u> Based on the RI and the Baseline Risk Assessment, EPA has established the following remedial action objectives for the Rochester Property Superfund Site:

- Reduce to acceptable levels, the excess risk to humans and environmental receptors associated with the media and contaminants of concern at the Site. This will be accomplished by a reduction in the concentrations of contaminants that result in excess risk to human health and the environment.

- Reduce the potential to ingest groundwater from the Site containing:

    - Carcinogen concentrations above Federal or State standards, or in the absence of standards, above levels that would exceed an acceptable cancer risk range of 10^{-4} to 10^{-6} (unless the risk manager decides that a risk level less than 10^{-4} (i.e., a risk between 10^{-4} and 10^{-6}) is unacceptable due to site-specific conditions), and

    - Noncarcinogen concentrations above Federal or State standards, or in the absence of standards, above levels that would exceed an acceptable Hazard Index (HI) of 1.0.

The Baseline Risk Assessment conducted by EPA concluded that surface soils, subsurface soils, surface water, and sediments at the Site are not media of concern. Exposure to these media did not result in risk to human health above acceptable guidelines. As a result, Remediation Goals were developed for groundwater and subsurface soils as they can effect groundwater. No contaminants in the subsurface soils exceeded the remediation goals. <u>In summary, the only media that poses a potential risk is groundwater, and only to a potential future resident that may install a private well.</u>

<u>Establishment of Remediation Goals.</u> EPA has established specific remediation goals (RGs) (i.e. cleanup standards) for certain groundwater contaminants. Such standards are established under several federal environmental laws, including the Safe Drinking Water Act (for water systems and potable water sources such as groundwater) and the Clean Water Act (for surface waters). The State of South

Carolina has similar statutes. Two organic contaminants regulated under these statutes are present at this Site. In cases where there is no state or federal standard, remediation goals were developed based on human health (risk assessment calculations). This was done for maganese. Table 1 summarizes the remediation goals for groundwater at the Site.

TABLE 1

REMEDIATION GOALS (Rgs) - GROUND WATER

	CHEMICAL OCCURRENCE		CONCENTRATION RANGE (ppm)	Rgs (ppm)	MCL (ppm)	RISK/HI
	NUMBER OF DETECTIONS	NUMBER OF SAMPLES				
Manganese	25	32	ND - 1.39	0.180	0.05[a]	<1.0
Trichloroethene	9	32	ND - 0.180	0.005	0.005	10^{-6}
Bis(2-ethyl hexyl)phthalate	3	32	ND - 0.033	0.006	0.006	10^{-6}

KEY

a = Secondary MCL (not health based)
ND = Non Detect

Development of Remedial Alternatives. In the FS, remedial alternatives were developed and evaluated for groundwater contamination. Alternatives were not developed to address the other media since only the groundwater poses a potential risk and only to a potential future resident.

To formulate the alternatives for cleanup, all of the possible technologies, processes and methods which could be utilized in a cleanup effort were evaluated, and those which could not be used at the Site were screened out. The screening criteria employed are primarily site-specific factors that make some technologies or processes ineffective, difficult to implement, or not feasible. Such factors include soil type, Site geology and/or hydrogeology, Site location, and the area or volume of contaminated media. Technologies and processes considered to be potentially useful were then grouped together into remedial alternatives to address groundwater contamination. Then, the alternatives were evaluated and compared against one another in detail.

EVALUATION OF REMEDIAL ALTERNATIVES

In selecting its preferred alternative, EPA used the following criteria to evaluate the alternatives developed in the FS. Seven (7) of the criteria were used to evaluate all the alternatives, based on environmental protection, cost, and engineering feasibility issues. The preferred alternative is further evaluated based on the final two (2) criteria.

Threshold Criteria: The first two (2) statutory requirements must be met by the alternative:

1. *Overall Protection of Human Health and the Environment* addresses the degree to which an alternative meets the requirement that it be protective of human health and the environment. This includes an assessment of how the public health and environmental risks are properly eliminated, reduced, or controlled through treatment, engineering controls, or controls placed on the property to restrict access and (future) development.

2. *Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)* addresses whether or not an alternative complies with all state and federal environmental and public health laws and requirements that apply or are relevant and appropriate to the conditions and cleanup options at a specific site. If an ARAR cannot be met, the analysis of the alternative must provide the grounds for invoking a statutory waiver.

Primary Balancing Criteria: These five (5) considerations were used to develop the decision as to which alternative should be selected.

3. *Long-Term Effectiveness and Permanence* refers to the ability of an alternative to maintain reliable protection of human health and the environment over time once the cleanup goals have been met.

4. *Reduction of Toxicity, Mobility, and Volume through Treatment* addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the contaminant as their principal element.

5. *Short-Term Effectiveness* addresses the impacts of the alternative on human health and the environment during the construction and implementation phase, until remedial action objectives have been met.

6. *Implementability* refers to the technical and administrative feasibility of implementing an alternative, including the availability of various services and materials required for its implementation.

7. *Cost* consists of the capital (up-front) costs of implementing an alternative, plus the costs to operate and maintain the alternative over the long term. This cost is calculated over the number of years the alternative is expected to take and the cost is then transferred into what it would cost today (referred to as present worth (PW) costs). Under this criterion, the cost-effectiveness of the alternative can be evaluated.

Modifying Criteria: These two (2) considerations indicate the acceptability of the alternative to the public, and/or local or State officials.

8. *State Acceptance* addresses whether, based on its review of the RI, FS, and Proposed Plan, the State concurs with, opposes, or has no comments on the alternative once it is proposed by EPA as the selected alternative (or "remedy").

9. *Community Acceptance* addresses whether the public agrees with EPA's selection of the alternative. Community acceptance of this Proposed Plan will be evaluated based on comments received during the upcoming public meeting and during the public comment period.

SUMMARY OF THE REMEDIAL ALTERNATIVES

Alternatives for Remediation of Groundwater. Four (4) alternatives were developed to address groundwater contamination. The components of Alternative 2, institutional controls and groundwater monitoring, are implied for all alternatives except 1, the "no action" alternative (though monitoring is included with alternative 1). The costs for monitoring for all the alternatives, is for a thirty (30) year period. For the alternatives which involve a treatment technology, the cost is for a ten (10) year operating period. For each alternative, remedial action objectives will be considered met when the concentrations listed in Table 1 are not exceeded in any monitoring wells.

ALTERNATIVE 1 - NO ACTION

Under the no action alternative, the Site is left "as is" and no funds are expended for the control or cleanup of the contaminated groundwater. A second component of this alternative would be to monitor the Site groundwater conditions. It will serve as a baseline for comparison with the other alternatives.

If no action is taken, future risks to persons living on and near the Site will remain. Because hazardous contaminants would remain, a five (5) year review would be required under CERCLA.

PW Cost: $1.9 million
Implementation: N/A

ALTERNATIVE 2 - INSTITUTIONAL CONTROLS AND ACCESS RESTRICTIONS

The Institutional Controls alternative is designed to address the risks associated with the contaminated groundwater through access and use restrictions and natural attenuation. The Institutional Controls alternative provides institutional measures (security fencing and legal deed restrictions) to limit contaminant exposure pathways. Additionally, the alternative allows for natural attenuation to address contaminants in the groundwater.

The institutional controls to be used are deed restrictions and well permit restrictions. Deed restrictions prevent future use of the aquifer for such purposes as potable and industrial water supplies, irrigation, and washing. Permit restrictions issued by the State of South Carolina would restrict all well drilling permits issued for new wells on properties that may draw water from the contaminated groundwater plume. These restrictions could be written into the property deeds to inform future property owners of the possibility of contaminated groundwater beneath their property.

Groundwater monitoring would involve monitoring existing wells, and possibly installing additional monitoring wells. Groundwater samples from the wells would be collected and analyzed periodically to evaluate contaminant concentrations and to monitor the extent and direction of contaminant migration.

PW Cost: $1.9 million
Implementation: 5 - 14 years

ALTERNATIVE 3 - IN-SITU AIR SPARGING

In-situ air sparging would be accomplished by pumping air or nitrogen through wells or trenches in the saturated zone, creating a steady flow of gas, or bubbles, that rise through the aquifer. Air sparging creates a crude air stripper in the subsurface. The rising bubbles contact the dissolved contaminant and allow the TCE to volatilize. In addition to stripping the TCE, the addition of oxygen to the groundwater would promote biodegradation of bis(2-ethylhexyl) phthalate and oxidation of soluble manganese to its insoluble form. The insoluble manganese would then precipitate and be re-deposited in the soils, where it is already naturally occurring.

At the Site, all TCE contamination has been found in the shallow, water table wells. Therefore, horizontal air sparging well(s) (or trench(es)) would be installed at a depth below the water table. The trench would be dug, perforated pipe would be placed, and the trench would be backfilled with gravel. The air would be sparged below the water table, volatilizing the TCE. The vapors would travel through the gravel and through the topsoil layer on top of the gravel. Alternately, vent pipes or other venting systems could be placed through the gravel and top soil to facilitate vapor discharge. The estimated amount of TCE that would volatilize to the atmosphere is extremely low, about 1.5 pounds per year. The air sparging trench would be supplemented with top of bedrock air sparging wells, if necessary, to oxygenate the groundwater near observed high concentrations of manganese.

In addition to the extraction wells and treatment processes described above, this alternative would include implementation of all of the institutional controls and groundwater monitoring described in Alternative 2, thereby monitoring the effectiveness of the alternative and limiting future use of groundwater until clean-up goals are achieved.

PW Cost: $2.7 million
Implementation: 4 - 5 years

ALTERNATIVE 4 - GROUNDWATER EXTRACTION AND TREATMENT

The contaminated ground water would be contained, as well as, remediated, by using three (3) to four (4) extraction wells in the areas where there is groundwater contamination. The groundwater removal rate from the area is expected to be only two (2) to three (3) gallons per minute (or less). The actual number of wells, locations, pumping rate, and area of groundwater containment would be determined in the Remedial Design. The groundwater will be sequentially treated by air stripping to remove the TCE and oxidize the manganese, filtration to remove insoluble manganese, and activated carbon filtration to remove the bis(2-ethylhexyl)phthalate. If, during future sampling events, it is determined that bis(2-ethylhexyl)phthalate is not present in the groundwater, but was detected in the groundwater samples due to laboratory contamination, the carbon filtration portion of the treatment system will be removed. The limited volatile emissions (1.5 pounds per year) from the air stripper would not require that additional emissions control be employed (see FS Report).

After treatment, groundwater extracted from beneath the Site could be piped to a local stream. This disposal option may require obtaining, or at least meeting, the substantive requirements of a National Pollution Discharge Elimination System permit. Maintenance of the discharge permit would, at a minimum, require regular effluent monitoring for TCE, bis(2-ethylhexyl)phthalate, and manganese. Alternatively, the treated groundwater could be introduced into a series of reinfiltration trenches. These trenches would each contain a perforated PVC pipe embedded in a gravel layer and would be analogous to a septic tank leach field. The actual design of the trenches; i.e., length, depth, width, and number of trenches, would occur in the Remedial Design. Reinfiltration of the treated groundwater would require a no discharge permit. Implementation of this alternative would require submittal of a Preliminary Engineering Design Report to the state for approval. Additionally, this disposal option would, at a minimum, require regular effluent monitoring for TCE, bis(2-ethylhexyl)phthalate, and manganese.

In addition to the extraction wells and treatment processes described above, this alternative would also include implementation of all of the institutional controls and groundwater monitoring described in Alternative 2, thereby monitoring the effectiveness of the alternative and limiting future use of groundwater until clean-up goals are achieved. This alternative will take longer to reach the remediation goals because of the time necessary for the contaminant plume to reach the extraction wells.

PW Cost: $3.1 million
Implementation: 3 - 10 years

EPA'S PREFERRED ALTERNATIVE

After conducting a detailed analysis of all of the alternatives, EPA has selected the following alternative for groundwater remediation of the Rochester Property Superfund Site:

Alternative 3: In-Situ Air Sparging
Total PW Cost: $2.7 million

RATIONALE FOR THE PREFERRED ALTERNATIVE

Groundwater Alternative 1 (No Action) does not meet the threshold criteria of protecting human health and the environment and meeting ARARs. Alternative 2 (Institutional Controls/Monitoring) should be overall protective of human health and environment, but there is a slight uncertainty regarding the reduction of the manganese through natural attenuation. The other two (2) alternatives, Alternative 3 (In-Situ Air Sparging) and Alternative 4 (Groundwater Extraction and Treatment) will meet the two (2) threshold criteria of being protective of human health and the environment and meeting ARARs. Both alternatives meet the Superfund Amendments and Reauthorization Act of 1986 (SARA) requirements favoring active remediation of contaminated groundwater. Each one of the alternatives meet the five (5) balancing criteria. Alternative 3 will be easier and quicker to implement. Alternative 4 will take longer to clean-up the groundwater because of the time necessary for the entire contaminant plume to reach the extraction wells. Also, it will be difficult to meet the criteria for discharge to the creek, if this disposal option were chosen for Alternative 4.

In view of these comparisons, EPA believes that Alternative 3 is the best alternative for remediation of groundwater at the Site. Employing this Alternative would protect human health and the environment and result in meeting ARARs. The Alternative is easily implementable, will be effective in the long term, and reduces contaminant volume and mobility by treating the groundwater in a fairly short time period.

PUBLIC PARTICIPATION

EPA will hold a Public Meeting on Monday, June 28, 1993, to discuss the Preferred Alternative and the other alternatives evaluated in the FS. Officials from EPA and SCDHEC will present a summary of the RI/FS, the remedial alternatives, and how the preferred alternative was selected. The public is encouraged to attend this meeting.

EPA is also conducting a thirty (30) day public comment period, from Monday, June 14, 1993 to Wednesday July 14, 1993, in order to receive public input and comments on the preferred alternative for cleanup of the Site. Comments on the preferred alternative, the other alternatives, or other issues related to Site cleanup, are welcomed and are an important part of the decision-making process. Please send all comments to:

Ms. Sheri Panabaker
Remedial Project Manager
U.S. Environmental Protection Agency
345 Courtland Street, NE
Atlanta, Georgia 30365

EPA will review and consider all comments received during the comment period and the public meeting before reaching a final decision on the most appropriate remedial alternative for Site cleanup (the "remedy"). EPA's final decision will be issued in a Record of Decision, a legal document which formally sets forth the remedy. A ***Responsiveness Summary***, which contains all of the public comments received and EPA's responses to them, is part of the Record of Decision (ROD).

For more information on community relations in the Superfund process or at this Site, please contact:

Ms. Cynthia Peurifoy
Community Relations Coordinator
U.S. Environmental Protection Agency
345 Courtland Street, NE
Atlanta, Georgia 30365
(404) 347-7791, or 1-800-345-9233

What Comes Next

Upon signature of the ROD at EPA Region IV in Atlanta, EPA will inform the public of the final cleanup plan for the site by publishing notice in the local newspaper. EPA will then negotiate with the PRPs to secure performance and funding of the selected remedy, under EPA's oversight. This phase of site cleanup is called the **Remedial Design/Remedial Action Phase (RD/RA)**. EPA will continue to keep the community informed.

SITE INFORMATION REPOSITORY LOCATION:

Travelers Rest Library
310 South Main Street
Travelers Rest, South Carolina 29690
Contact: Ms. Debbie Miller, (803)834-3650

GLOSSARY

Administrative Record - A file which is maintained and contains all information used by the EPA to make its decision on the selection of a response action under CERCLA. This file is required to be available for public review and a copy is to be established at or near the site, usually at the information repository. A duplicate file is maintained in a central location such as a regional EPA and/or state office.

Applicable or Relevant and Appropriate Requirements (ARARs) - Requirements which must be met by a response action selected by EPA as a site remedy. "Applicable" requirements are those mandated under one or more Federal or State laws. "Relevant and appropriate" requirements are those which, while not necessarily required, EPA judges to be appropriate for use in that particular case.

Aquifer - An underground geological formation, or group of formations, containing usable amounts of groundwater that can supply wells and springs.

Baseline Risk Assessment - An assessment which provides an evaluation of the potential risk to human health and the environment in the absence of remedial action.

Carcinogens - Substances that cause or are suspected to cause cancer.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) - A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA). The Acts create a trust fund, known as Superfund, from taxes on chemical and petroleum companies, to investigate and clean up abandoned or uncontrolled hazardous waste sites.

Feasibility Study (FS) - See Remedial Investigation/Feasibility Study.

Groundwater - Underground water that fills pores in soils or openings in rocks. This water can be used for drinking, irrigation, and other purposes.

Information Repository - Materials on Superfund and a specific site located conveniently for local residents.

Maximum Contaminant Levels (MCLs) - The maximum permissible level of a contaminant in water that is consumed as drinking water. These levels are determined by EPA and are applicable to all public water supplies.

National Priorities List (NPL) - EPA's list of uncontrolled or abandoned hazardous wastes sites eligible for long-term clean up under the Superfund Remedial Program.

National Oil and Hazardous Substances Contingency Plan (NCP) - The Federal regulation that guides the Superfund program.

Noncarcinogens - Substances that may cause other adverse health effects besides cancer.

Potentially Responsible Parties (PRP's) - This may be an individual, a company or a group of companies who may have contributed to the hazardous conditions at a site. These parties may be held liable for costs of the remedial activities by the EPA through CERCLA Laws.

Public Comment Period - Time provided for the public to review and comment on a proposed EPA action or rulemaking after it is published as a Proposed Plan.

Record of Decision (ROD) - A public document that explains which cleanup alternative will be used at a National Priorities List site and the reasons for choosing the cleanup alternative over other possibilities.

Remedial Design/Remedial Action (RD/RA) - The remedial design (RD) is a plan formulated by either the PRP or EPA or both to provide the appropriate measures to remediate a hazardous waste site. This plan may be modified many times through negotiations between EPA an the PRP. The remedial action (RA) is the implementation of the remedial design.

Remedial Investigation/Feasibility Study (RI/FS) - Two distinct but related studies, normally conducted together, intended to define the nature and extent of contamination at a site and to evaluate appropriate, site-specific cleanup remedies.

Reasonable Maximum Exposure (RME) - A term used in the Baseline Risk Assessment. The RME is the highest exposure to contaminants that is reasonably expected to occur at a site.

Responsiveness Summary - A summary of oral and/or written public comments received by EPA during a comment period on key EPA documents and EPA's responses to those comments. The responsiveness summary is especially valuable during the Record of Decision phase at a site on the National Priorities List when it highlights community concerns for EPA decision-makers.

Resource Conservation and Recovery Act (RCRA) - A Federal law that establishes a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing and disposing of hazardous substances. RCRA is designed to prevent the creation of new uncontrolled hazardous waste sites.

Superfund Amendments and Reauthorization Act (SARA) - Modifications to CERCLA enacted on October 17, 1986.

Volatile Organic Compounds (VOCs) - Organic compounds which easily change from a liquid to a gas when exposed to the atmosphere.

REQUEST TO BE PLACED ON THE ROCHESTER PROPERTY SUPERFUND SITE MAILING LIST

If you would like your name and address placed on the mailing list for the Rochester Property Superfund Site, please complete this form and return to: Cynthia Peurifoy, Community Relations Coordinator, EPA-Region IV, North Superfund Remedial Branch, 345 Courtland Street, Atlanta, Georgia 30365, or call 1-800-435-9233.

NAME: ____

ADDRESS: ____

____

TELEPHONE: ____

AFFILIATION: ____

Attachment B

Public Notices of Public Comment Period and Extension of Public Comment Period

The Greenville News

Monday, June 14, 1993

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY ANNOUNCES A PUBLIC COMMENT PERIOD AND PUBLIC INFORMATION MEETING ON THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY AND PROPOSED PLAN FOR THE ROCHESTER PROPERTY SUPERFUND SITE, TRAVELERS REST, GREENVILLE COUNTY, SOUTH CAROLINA

The Remedial Investigation/Feasibility Study for the Rochester Property Superfund Site In Travelers Rest, Greenville County, South Carolina has been completed. The Feasibility Study evaluated alternatives for addressing groundwater contamination at the site. Four alternatives were evaluated:

Alternative 1. No Action
Alternative 2. Institutional Controls and Access Restrictions
Alternative 3. In-Situ Air Sparging
Alternative 4. Groundwater Extraction and Treatment

EPA is proposing to implement Alternative 3. EPA believes that the preferred alternative. In-Situ Air Sparging, achieves the best balance of trade-offs among the criteria EPA uses to evaluate remedial alternatives. Employing this alternative would protect human health and the environment and will meet Applicable and Appropriate Requirements (ARARs), is cost effective, utilizes a permanent solution and alternative treatment or resource recovery technologies to the maximum extent practicable, and satisfies the statutory preference for treatment as the principal element. In-situ air sparging would be accomplished by pumping air or nitrogen through wells or trenches in the saturated zone, creating a steady flow of gas, or bubbles, that rise through the aquifer to remove the contaminants. This alternative would include implementation of institutional controls and groundwater monitoring, thereby monitoring the effectiveness of the alternative and limiting future use of groundwater until cleanup goals are achieved.

EPA will not make a final decision on the proposed plan until it has reviewed and considered all public comments it receives. Therefore, it is important to comment on the preferred alternative and the other alternatives evaluated in the feasibility study. EPA has established a 30-day comment period to give the public an opportunity to comment on the proposed plan and the other alternatives contained in the feasibility study, along with the administrative record. The comment period begins on Monday, June 14, 1993 and ends on Wednesday, July 14, 1993. Written comments, which must be postmarked no later than Wednesday, July 14, 1993, should be sent to:

Sheri Panabaker, Remedial Project Manager
South Carolina Section, North Superfund Remedial Branch
Waste Management Division
U.S. Environmental Protection Agency, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365
404-347-7791 or 1-800-435-9233

EPA has scheduled a public meeting to present the proposed plan. The meeting also provides the public an opportunity to submit oral and written comments on the proposed plan and the other alternatives. The meeting will be:

Date: Monday, June 28, 1993
Time: 7:00 p.m.
Location: Travelers Rest City Hall
Council Chambers
160 State Park Road
Travelers Rest, South Carolina

Copies of the proposed plan are available at the site information repository located at the Travelers Rest Library, 310 South Main Street, Travelers Rest, South Carolina. The administrative record for the site is also available for review at the site information repository and at the Records Center at the EPA Region IV Office in Atlanta, Georgia. The administrative record contains all documents, including the RI/FS Reports and other information that EPA relied upon in reaching its decision on the alternative chosen as its preferred alternative in the proposed plan.

For more information, or be added to EPA's mailing list for the site, contact Cynthia B. Peurifoy, Community Relations Coordinator, South Carolina Section, U.S. Environmental Protection Agency, 345 Courtland Street, N.E., Atlanta, Georgia 30365, 404-347-7791 or 1-800-435-9233.

N15555-G

The Monitor Wednesday, June 16, 1993

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ANNOUNCES A
PUBLIC COMMENT PERIOD AND PUBLIC INFORMATION MEETING
ON THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY AND PROPOSED PLAN

FOR THE ROCHESTER PROPERTY SUPERFUND SITE, TRAVELERS REST,

GREENVILLE COUNTY, SOUTH CAROLINA

The Remedial Investigation/Feasibility Study for the Rochester Property Superfund Site in Travelers Rest, Greenville County, South Carolina has been completed. The Feasibility Study evaluated alternatives for addressing groundwater contamination at the site. Four alternatives were evaluated:

Alternative 1. No Action
Alternative 2. Institutional Controls and Access Restrictions
Alternative 3. In-Situ Air Sparging
Alternative 4. Groundwater Extraction and Treatment

EPA is proposing to implement Alternative 3. EPA believes that the preferred alternative, In-Situ Air Sparging, achieves the best balance of trade-offs among the criteria EPA uses to evaluate remedial alternatives. Employing this alternative would protect human health and the environment and will meet Applicable and Appropriate Requirements (ARARs), is cost effective, utilizes a permanent solution and alternative treatment or resource recovery technologies to the maximum extent practicable, and satisfies the statutory preference for treatment as the principal element. In-situ air sparging would be accomplished by pumping air or nitrogen through wells or trenches in the saturated zone, creating a steady flow of gas, or bubbles, that rise through the aquifer to remove the contaminants. This alternative would include implementation of institutional controls and groundwater monitoring, thereby monitoring the effectiveness of the alternative and limiting future use of groundwater until cleanup goals are achieved.

EPA will not make a final decision on the proposed plan until it has reviewed and considered all public comments it receives. Therefore, it is important to comment on the preferred alternative and the other alternatives evaluated in the feasibility study. EPA has established a 30-day comment period to give the public an opportunity to comment on the proposed plan and the other alternatives contained in the feasibility study, along with the administrative record. The comment period begins on Monday, June 14, 1993 and ends on Wednesday, July 14, 1993. Written comments, which must be postmarked no later than Wednesday, July 14, 1993, should be sent to:

Sheri Panabaker, Remedial Project Manager
South Carolina Section, North Superfund Remedial Branch
Waste Management Division
U.S. Environmental Protection Agency, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365
404-347-7791 or 1-800-435-9233

EPA has scheduled a public meeting to present the proposed plan. The meeting also provides the public an opportunity to submit oral and written comments on the proposed plan and the other alternatives. The meeting will be:

Date:	Monday, June 28, 1993
Time:	7:00 p.m.
Location:	Travelers Rest City Hall Council Chambers 160 State Park Road Travelers Rest, South Carolina

Copies of the proposed plan are available at the site information repository located at the Travelers Rest Library, 310 South Main Street, Travelers Rest, South Carolina. The administrative record for the site is also available for review at the site information repository and at the Records Center at the EPA Region IV Office in Atlanta, Georgia. The administrative record contains all documents, including the RI/FS Reports and other information that EPA relied upon in reaching its decision on the alternative chosen as its preferred alternative in the proposed plan.

For more information, or to be added to EPA's mailing list for the site, contact Cynthia B. Peurifoy, Community Relations Coordinator, South Carolina Section, U.S. Environmental Protection Agency, 345 Courtland Street, N.E., Atlanta, Georgia 30365, 404-347-7791 or 1-800-435-9233.

The Greenville News

THURSDAY, JULY 15, 1993

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Announces an *Extension of the Public Comment Period* for the Proposed Plan for the Rochester Property Superfund Site, Travelers Rest, South Carolina

The U.S. Environmental Protection Agency (EPA) is extending the period of time for accepting public comments on the Agency's proposed plan and the other alternatives considered for the Rochester Property Superfund Site to Friday, August 13, 1993. Written comments, which must be postmarked on or before August 13, 1993, should be sent to:

Sheri Panabaker
Remedial Project Manager
U.S. EPA, Region IV
North Superfund Remedial Branch
345 Courtland Street, N.E.
Atlanta, Georgia 30365

EPA will not make a final cleanup decision for the site until it has reviewed and considered all public comments it receives. Based on public comments or new information, the EPA may decide on another alternative, rather than the plan that has been proposed. Therefore, it is important to comment on the proposed plan and the other alternatives evaluated in the feasibility study. Copies of the feasibility study and the EPA's proposed plan are available for public review at the Rochester Property Superfund site information repository located at:

Travelers Rest Branch Library
315 South Main Street
Travelers Rest, South Carolina
(803) 834-3650

The administrative record for the site is also available for review at the Travelers Rest Library. The administrative record contains all documents, reports, and other material the EPA relied upon in reaching a decision on the selection of the proposed plan. For more information, please contact:

Cynthia Peurifoy
Community Relations Coordinator
U.S. EPA, Region IV
North Superfund Remedial Branch
345 Courtland Street, N.E.
Atlanta, Georgia 30365
Toll-Free: 1-800-435-9233
(404) 347-7791

N-10900-G

Attachment C

Written Public Comments Received
During the Public Comment Period

August 12, 1993

Ms. Sheri Panabaker
Remedial Project Manager
US EPA Region IV
345 Courtland Street
Atlanta, Georgia 30365

Subject: Comments on the Proposed Plan for Rochester Property Site, Travelers Rest, South Carolina

Dear Ms. Panabaker:

The following text presents comments on behalf of Colonial Heights Packaging to the Proposed Plan detailing the preferred remedial alternative for cleanup of ground water at the Rochester Property Site located in Travelers Rest, South Carolina. These comments address the following issues: deed restrictions, additional monitoring requirements, use of nitrogen as sparging gas, and necessity of deep sparging wells.

Deed Restrictions

The selected remedial alternative (Alternative 3) includes implementation of the institutional controls and ground water monitoring described in Alternative 2. Institutional controls are an appropriate addition to *in situ* air sparging; however, the generic language used to describe the institutional controls requirement in Alternative 2 might be misunderstood as requiring deed restrictions or well permit restrictions on properties nearby the site. Based on the Remedial Investigation completed at the Rochester site, the only property on which deed restrictions or well permit restrictions should be placed is the Rochester property itself.

Analytical results obtained from the ground water samples collected during the Remedial Investigation demonstrate that the contaminated ground water plume is contained within the Rochester property boundaries. Two lines of monitoring wells are present on-site east and downgradient of the Rochester former trench disposal area. The inner line of water table and top of bedrock monitoring wells is located 30 to 50 feet downgradient of the former source area. The outer line of water table and top of bedrock monitoring wells is located 120 feet downgradient of the former source area. All monitoring wells are located inside the Rochester property boundaries.

The organic contaminants detected at the site above cleanup standards were found in the first line of monitoring wells, located some distance from the boundaries of the Rochester property. No organic contaminants exceeded cleanup standards in the ground water samples collected from the outer or second line of monitoring wells located further downgradient of the former trenches. In fact, the only organic contaminant ever detected was found in a single EPA split sample in which trichloroethene was detected at an estimated concentration of 0.0014J ppm (significantly below the maximum contaminant level of 0.005 ppm). Otherwise no organic contaminants have been detected in the outer line of downgradient monitoring wells.

Since organic contaminants have not migrated as far as the outer line of downgradient site monitoring wells, the only property on which institutional controls are necessary or appropriate is the Rochester property. To clarify this point, the Record of Decision should specify that placement of deed restrictions and well permit restrictions will be required only for the Rochester property.

i:\wp\5\58505.ltr/odf93

Additional Monitoring Wells

The ground water monitoring requirement of Alternative 2 is also included within the selected remedial alternative, Alternative 3. Alternative 2 indicates that ground water monitoring will involve monitoring existing wells, and possibly installing additional monitoring wells. Our comments on ground water monitoring requirements are as follows:

As discussed above, organic contaminants are present at the Rochester site above cleanup levels only in the first line of monitoring wells, directly downgradient from the former waste disposal trench. Concentrations of organic contaminants above cleanup levels have not been detected further downgradient in the site's second line of monitoring wells. Since monitoring results indicate that site effects are primarily confined to the area immediately downgradient of the trench source and the first line of monitoring wells, the second more downgradient line of monitoring wells will serve as compliance or detection monitoring points. Any migration of organic contaminants in ground water would be detected in the existing monitoring wells before ground water contamination would reach the property boundary.

In addition, the preferred Remedial Alternative (Alternative 3) will involve the installation and operation of an air sparging trench which will mitigate the potential off site migration of contaminants. The trench will likely be located between the two lines of monitoring wells. The contaminants found in the first line of monitoring wells should be intercepted by the trench prior to reaching the second line of monitoring wells. Thus the preferred alternative is intended to contain and treat contaminants on the site, and will prevent contamination from migrating off site.

With the installation and operation of the air sparging trench, the existing site monitoring network will be more than adequate to provide long-term site monitoring. The Record of Decision should not require the installation of any new monitoring wells since additional monitoring wells are not necessary to monitor contaminant migration and would achieve no further protection of human health and the environment. The ground water monitoring requirement in the Record of Decision should provide for monitoring of existing wells, but the determination of the location and number of wells to be monitored should not be made until the remedial design stage when the air sparging trench and the ground water monitoring plan can be designed to best complement each other.

Use of Nitrogen as the Sparging Gas

In the Proposed Plan, the preferred alternative (Alternative 3) is air sparging by means of an engineered trench. The proposed plan states that "*In-situ* air sparging would be accomplished by pumping air or nitrogen through wells or trenches in the saturated zone, . . ." In addition to acting as an air stripper, the air sparging system ". . . would promote biodegradation of bis(2-ethylhexyl)phthalate and oxidation of soluble manganese. . ." The use of nitrogen as the sparging gas would not achieve the latter two remedial activities. The use of **ambient air** as the sparging gas would, however, achieve the stated remedial objectives (i.e. Air stripping and enhanced biodegradation of the volatile organic compounds, enhanced biodegradation of bis(2-ethylhexyl)phthalate, and oxidation of soluble manganese to its insoluble form).

We request that the Record of Decision delete references to the use of nitrogen as a potential sparging gas for the preferred alternative. In Section 4 of the Feasibility Study for the Rochester Property Site, during the general discussion of remedial technologies, the potential use of nitrogen as a sparging gas was discussed. However, in subsequent sections of the Feasibility Study where the technology was applied to site-specific conditions, nitrogen was eliminated from consideration. Nitrogen was eliminated for three reasons: (1) Nitrogen is expensive and is only used when necessary; (2) nitrogen would not introduce oxygen to stimulate *in-situ* biodegradation of non-volatile organics; and (3) nitrogen would not oxidize manganese and precipitate it out of solution. Given the nature and extent of the site-specific contaminants at the Rochester Property Site, **ambient air** is likely the most appropriate sparging media.

Necessity of Deep Sparging Wells

The description of the preferred remedial alternative (Alternative 3 - Air Sparging) states that "The air sparging trench would be supplemented with top of bedrock air sparging wells, if necessary. . ."

Elevated concentrations of manganese were observed in two shallow and two deep monitoring wells. Manganese detections during the Remedial Investigation did not correlate with locations of waste-related organics (i.e., trichloroethene or bis(2-ethylhexyl)phthalate). Three of the wells with manganese concentrations (4A, 6A and 8) contained concentrations of waste-related compounds at levels below detection limits.

The background soil concentrations of manganese at the site ranged from 135 to 620 ppm (RMT and NUS). No downgradient soil samples contained elevated concentrations of manganese. The samples of waste material collected during the Waste Removal Action in 1989 contained manganese at concentrations similar to soil background (48 to 209 ppm). As a result, the dissolved manganese does not appear to be directly related to the former waste disposed at the site, but rather is a naturally-occurring element.

Although manganese is typically found in soils as insoluble oxides, subsurface conditions can result in manganese becoming mobile and entering the ground water. The presence of the removed waste may have indirectly resulted in the solubilization of the naturally-occurring manganese in the subsurface. The solubilization of naturally-occurring manganese will diminish because the waste source has been removed and because the residual organic compounds will volatilize and biodegrade following implementation of the air sparging system. The optimal design and operation of the remedial system should target the removal of residual waste-related organic contaminants from the ground water underlying the site. Since the *in-situ* air sparging trench will address the mobilization of naturally-occurring manganese, the installation and operation of individual air sparging wells at the top of bedrock will not be necessary.

We appreciate the opportunity to comment on the proposed plan. If you have any questions relating to the enclosed comments, please contact me at (803) 281-0030.

Sincerely,

RMT, Inc.

Jack A. Burgess, Jr., for

Jack A. Burgess, Jr., P.E.
Project Manager

cc: Nancy Peterson, Quarles and Brady
Mark Davis, US EPA

i:\wp\5\58505.ltr/odf93

LEATHERWOOD WALKER TODD & MANN, P.C.

ATTORNEYS AT LAW

FLETCHER C. MANN
JOHNNIE M. WALTERS
JAMES H. WATSON
J. BRANTLEY PHILLIPS, JR.
JOHN E. JOHNSTON, JR.
HARVEY G. SANDERS, JR.
DAVID A. QUATTLEBAUM, III
O. DOYLE MARTIN
JOSEPH E. MAJOR
DUKE K. McCALL, JR
O. JACK TAYLOR, JR
EARLE G. PREVOST
J. RICHARD KELLY
H. SPENCER KING
A. MARVIN QUATTLEBAUM
CARL G. FERGUSON
JACK H. TEDARDS, JR
F. MARION HUGHES
MICHAEL J. GIESE
MARK R. HOLMES
WILLIAM L. DENNIS
BRADFORD NEAL MARTIN
NATALMA M. McKNEW
ROBERT A. deHOLL
RICHARD L. FEW, JR.
STEVEN E. FARRAR
NANCY HYDER ROBINSON
RUSSELL D. GHENT
SAMUEL W. OUTTEN
EUGENE C. McCALL, JR.
ALEXANDER HRAY, JR.
H. SIBERT SANDERS, III
JAMES H. RITCHIE, JR.
THOMAS W. EPTING
JAMES L. ROGERS, JR
TARA H. SNYDER
SANDRA L. W. MILLER
FRANK T. WILLIAMS
SUSAN A. FRETWELL
P. MATTHEW CARRUTHERS, JR.
JOHANNA B. SEARLE
ROBERT D. MOSELEY, JR.

100 EAST COFFEE STREET
POST OFFICE BOX 87
GREENVILLE, S.C. 29602-0087
FAX: (803) 233-8461

TELEPHONE: (803) 242-6440

SPARTANBURG OFFICE
1451 EAST MAIN STREET
POST OFFICE BOX 3188
SPARTANBURG, S.C. 29304-3188
FAX: (803) 583-8961
TELEPHONE: (803) 582-4365

COUNSEL
WESLEY M. WALKER
J. D. TODD, JR

D. B. LEATHERWOOD
1896-1989

July 15, 1993

Ms. Sheri Panabaker
U.S. Environmental Protection Agency
345 Courtland Street N.E.
Atlanta, GA 30365

RE: Rochester Property Superfund Site

Dear Ms. Panabaker:

I spoke today with Mark Davis of your office regarding the public comment period on the Rochester Property Superfund Site. You will recall that a public hearing was held in Travelers Rest, South Carolina on June 28, 1993 concerning the EPA's proposed plan for the Rochester site. Mr. Davis informed me that the public comment time period had been extended for 30 days from today's date.

This letter is to formalize the request by my father, that as part of the EPA's proposed plan for cleanup of the Rochester site, the PRP's be required to place monitoring wells on the property of adjacent landowners. The purpose of this request, as I indicated during the public hearing, is to provide adjacent landowners with certification that their property has not been contaminated by the Rochester pollution. We request that the cost of providing these monitoring wells be borne by the PRP's.

I have spoken with attorney David Flowers, who also represents certain adjacent and/or nearby landowners. Mr. Flowers concurs in this request on behalf of his clients.

We would appreciate being kept apprised of the EPA's decision making process as to the Rochester site. Further, I would appreciate your providing me with a copy of the names and addresses, along with contact persons, for the PRP's for the Rochester site.

Thank you very much for your helpfulness and cooperation. I enjoyed meeting you, Mark, Bernie and Cynthia at the public hearing in Travelers Rest. If, upon receipt of this correspondence, you have any questions or comments, please don't hesitate to give me a call.

With kind regards,

Yours very truly,

James L. Rogers, Jr.
Leatherwood Walker Todd & Mann, P.C.

JLRjr/pd

cc: James L. Rogers, Sr.
David Flowers

Attachment D

Proposed Plan Public Meeting Sign-In Sheets

P. /SED PLAN PUBLIC INFORMATION MEETING
ROCHESTER PROPERTY SITE, TRAVELERS REST, SC
June 28, 1993

SIGN-IN SHEET

NAME/ADDRESS/TELEPHONE NUMBER	REPRESENTING	ADD TO MAILING LIST? (PLEASE CHECK)	HOW DID YOU HEAR OF THIS MEETING?
Ralph + Opal Phillips [redacted]			
J.L. Rogers [redacted]	SELF	yes	NOTICE
Billy Britton [redacted]	SC DHEC		Notice
Wayne Hawkins [redacted]	Self	✓	Has Private well Mail Notice (send map) was tested 2½-3 years ago!
Donald Cogdill [redacted]			Water comes from spring north of Site
Ralph Phillips [redacted]	Self		Lives 150 ft from Site - wants well tested

P. ƷED PLAN PUBLIC INFORMATION MEETING
ROCHESTER PROPERTY SITE, TRAVELERS REST, SC
June 28, 1993

SIGN-IN SHEET

NAME/ADDRESS/TELEPHONE NUMBER	REPRESENTING	ADD TO MAILING LIST? (PLEASE CHECK)	HOW DID YOU HEAR OF THIS MEETING?
[redacted] RAY GARZONE SR.	need tax # MAP Self CITY + WELL water		mail
J. David Flowers [redacted]	Robert L. Wheaton		client
Todd Going [redacted]			
Jay Rogers [redacted]	-		—

REGION IV PROPOSED PLAN MEETING

of

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

for the

ROCHESTER PROPERTY SUPERFUND SITE

TRAVELERS REST, SOUTH CAROLINA

Travelers Rest, SC

June 28, 1993

Deborah Garrison
Court Reporter
245-D East Broad Street
Greenville, S.C. 29601
(803) 244-0973

MINUTES OF EPA PUBLIC HEARING

BY CYNTHIA PEURIFOY:

My name is Cynthia Peurifoy. I'm the Community Relations Coordinator for EPA Region IV sites in South Carolina and on the National Priorities list. I'd like to thank you for coming out tonight to our Proposed Plan meeting for the Rochester property site.

First of all, I'd like to introduce some people who are here representing EPA and the South Carolina Department of Health and Environmental Control.

First, we have Sheri Panabaker, who is Remedial Project Manager for the site.

Then we have Bernie Hayes, who is also Remedial Project Manager in our section.

We have Mark Davis, who is our Attorney for EPA on the site.

From the South Carolina Department of Health and Environmental Control, we have Billy Britton representing South Carolina DHEC.

I have up here an overhead that shows you the Superfund process. I'm not going to go into a lot of detail on it, just to let you know that right now, we're finishing up the remedial investigation of the

Feasibility Study. The site is a Superfund Site so it has gone through all of the other elements. It was discovered, it was ranked and placed on the national priorities list. Sheri is going to go into a lot of the history of the site. We'll see how all of that took place and what's been going on since the site was discovered.

We're now into Block 5 which is public comments on the feasibility study and our remedial investigation. We are right now in the middle of a public comment period which ends on July 14. That public comment period can be extended, if we receive a formal request for additional hearing date.

We have an administrative record that has been put together for the site that is available at the Travelers Rest Library here. It contains all of the documents that EPA used to make its decision on the Proposed Plan for the site.

Let me tell you about a few elements of our community relations program. We were here well over a year ago to do the initial interviews and to develop a Community Relations Plan. It's also available for review at the Information Repository. We've done several different things over the time. We've updated information that's in the Information Repository. All of the latest information is sent there. We've put out fact sheets. When Sheri is in the area, she visits with people who live near the site. We're always available to answer any questions that you have. We have an 800 number, which is on our fact sheet, which you can always call and ask any questions that you have or express any concerns that you may have about our activities at the site.

One thing I want to point out that's not really clearly defined is that before EPA goes into the remedial investigation feasibility study, it negotiates with what we call potentially responsible parties. These are the parties which, for some reason, have had some responsibility for the contamination at the site. We did do that on this site and we have had -- Sheri is going to talk about it, but -- so this is the work that has been done on this site and has been funded by potentially responsible parties. That was conducted by them with EPA oversight.

I'd like to ask you, when you have questions and comments, to identify yourself so that our court reporter can be sure to record what you say so that we can use it. What we're going to do after this is that we're going to write a responsiveness summary where we're going to answer all of your questions and concerns prior to making a final decision on the cleanup plan for this site.

At this point, I would like to introduce Ms. Sheri Panabaker who is going to come up and give you some site history and a lot of information on what took place on the remedial investigation and feasibility study.

BY MS. PANABAKER:

Thank you. My name is Sheri Panabaker and I'm the Remedial Project Manager of this site.

Tonight I'm going to talk about the findings of the remedial investigation and the feasibility study.

First, I'm going to go over the site history a little bit. Between 1971 and 1972, towards the end of '71 and early '72, waste materials were placed in four trenches on the property, believed to be glue, print binders, envelope adhesive. The trenches were about forty feet long, three feet wide and ten feet deep. The site was discovered by the State of South Carolina when they were making septic tanks inspections. In 1984, the South Carolina Department of Health and Environmental Control (DHEC) did a site inspection in which they conducted sampling from the waste, groundwater, surface soils and some surface water from the nearby creeks. Additional samples were collected by the PRP and also by EPA.

In 1986, the site was proposed to go on the National Priorities List.

In 1989, it was added. That same year EPA and PRP entered into negotiations to initiate work.

In 1990 they removed waste and a substantial amount of soil from the site to a hazardous landfill off-site.

In 1992, EPA instituted a remedial investigation and feasibility study. The remedial investigation was conducted this past summer, in August, September, and December. During that time soil samples, sediments and groundwater was collected. Further remedial investigation was done, which was called a "Baseline Risk Assessment." This is where we determined that there was some concern and the exposure pathways, risk to the environment.

Before I go any further, Bernie Hayes is going to discuss the risk assessment. And later I will talk about the solution.

BY MR. HAYES:

Thank you, Sheri. My name is Bernie Hayes, as Sheri mentioned. I'm going to talk a little bit about the general concepts of Risk Assessment and Superfund.

I did not work on the Risk Assessment for the site, so I don't know in great detail too much about the individual risks. As Sheri said, she'll talk about those when she comes back up here. To put it into some kind of context and let you'all know about how EPA conducts risk assessments and the general principles involved, she asked me to talk a little bit about that subject.

I have some general slides here. The first one, "Risk Assessments and Superfund Sites". Two terms that we use a lot, "risk" and "risk assessment." The definition of "risk" is the "likelihood communicable substances at a site can cause health effects in people on the site and nearby the site."

The risk assessment process is a way that EPA -- a standard process that EPA uses in evaluating both current risks that exist at the site now and current conditions of exposure, and we also look at future risks posed by the contaminants that the remedial investigations discovers at the site. The future risk is often evaluated on a "worse case" scenario. The most common future exposure scenario that we look at in the risk assessment process is as if someone were actually living on the site.

An important thing to keep in mind when you talk about risk assessment is that we're only going to, in the risk assessment process, look at those contaminants that are specifically associated with the site, and with whatever disposal practices took place in them.

There are, as I said, potentially hazardous substances that occur throughout the environment. Some of them occur naturally. Lead and arsenic, for instance, are elements that are found through the earth's crust, and could be present just about anywhere in natural soils. Human activist rights are common. We all know about the health effects associated with auto emissions in big cities. There has been some concern in some areas about woodburning stoves, the air pollution problems that are caused by those. The ones that we're concerned about, human activities that are location specific and create considerable waste material and -- things like glue-preserving, battery recycling, the kinds of things that generate Superfund sites. As the last line there indicates, Superfunds are only concerned about risk and hazardous substance that exist because of this last activity.

"Environmental Health Risks". For any kind of risk to occur, you have to have two things. You have to have had a contaminant. In other words, a contaminant that can cause an adverse health effect has to be present. And it has to be present in a concentration that can result in some adverse health impact. And some exposure must take place. In other words, there must be some way for that contaminant to travel or migrate to a point of exposure for human populations. Expanding on that, adverse substances must be present, which is why we do the removal investigation to see what hazardous substance may be present at that site in whatever media: soil, groundwater, air.

Then EPA, in the Risk Assessment process, we make assumptions about potential exposure under current conditions and future conditions. Those assumptions involve things like standard rates for drinking water. We assume that people normally drink about two liters of water a day. We assume a standard adult body weight, 70 kilograms. We assume, under conditions of soil exposure, that a child playing on the site or if someone were to happen to go on there, a child playing in the yard, that the child accidently ingests a certain amount of soil each time he plays in the yard. So we have a certain standard exposure assumptions that we use throughout the assessment process. Those exposure assumptions allow -- as I said, they're an objective evaluation of the way we question. In other words, we use the same procedures at all sites. We use the same standard assumptions at all sites so that we can answer the questions of 'what if somebody built a home on this site once EPA is done with it or cleanup has been finished?' 'What if someone were to sink a private well there and use it for their drinking water supply for their home?' And the need for the degree of cleanup on the site depends largely on the outcome of this risk assessment process. We have standard benchmarks in terms of what is acceptable, acceptable health risks. And if those benchmarks are exceeded by exposure than we estimated at the site, then some kind of response or cleanup is warranted.

As it says here (on overhead slide displayed), "We develop these reference intake levels for toxic substances and potency levels for carcinogens for both human and animal studies." In other words, we've gone into the -- research has been conducted on the toxicity of these contaminants. Some of it has been done exclusively on animal population. There is some human data for some contaminants.

From those studies, with appropriate safety factors, we have come up with what are either safe levels of exposure or insignificant levels of exposure. I'd like to come back to that point in a minute.

The determination of exposure -- we make these conservative assumptions with respect to potential exposure. Past or current exposure is not a prerequisite. In other words, we could have a site that is totally controlled as far as access, that nobody is using the groundwater and never has, and yet, we have full authority to action for a cleanup based on the potential for health effects to occur under future exposure scenarios, such as the development of a piece of property for residential purposes.

The sources of that toxicity data is basically three general categories:

Human studies. For most contaminants that exist, we don't have human studies. There are several reasons for that. The primary one being that we can't experiment on human beings. You can't take a human being and expose them to levels of contaminants that you know are considered to be toxic to see what kind of effect it has. It's just not ethical.

In some cases, though, there have been epidemiological studies where the exposure was inadvertent or unknown for some time and we've gone in and studied the effects on those populations which were exposed and we can gather some data on health effects from these inadvertent exposures that have occurred.

Generally, however, we depend on animal studies. Acute toxicity studies being the -- the best analogy is a poison. Acute effects are effects which occur immediately, and are the result of high levels of exposure. Chronic toxicity studies are looking at the long-term effects that it has, more subtle effect perhaps that occur at lower levels of exposure over a long period of time. Specialized toxicity studies involve teratology which is developmental effects, effects on unborn fetuses and mutagenicity, which, just as the name implies, is mutated genetic material.

Test tube studies. There are certain types of tests that help us examine both the epidemiological and mutagenicity of certain contaminants using microbacteria or even (inaudible) cells -- excuse me.

The main point you want to take away from that slot is that the data on most of the contaminants that we have some knowledge of is derived not through human studies, but from animal studies or some other type of research.

And these are -- when we don't have human data to work with, then certainly we're working from what are unconfirmed assumptions. The toxicity of any given contaminant can vary from species to species. So while we may have considerable data on health effects of contaminants with respect to animals used in research, it is by no means certain those same effects would be experienced by humans.

The high-dose to low-dose extrapolations is another unconfirmed assumption that lends some uncertainty to the risk assessment process. That means that in order to conduct these studies in a relatively short period of time, the animals that are used are exposed to very high concentrations. The high concentrations which they are exposed to for a short period of time, those results are then extrapolated to what the results might be if that exposure had been for a much longer period of time at lower doses, doses that you might reasonably expect the animal to actually be exposed to. So in order to get the studies done in a reasonable period of time, the animal is exposed at a very high dose and we have to sort of convert that high dose effect down to what might be expected at a lower dose.

The exposure assumptions are sometimes unconfirmed, as well. As I said, the future exposure scenarios -- even though the word "scenarios" up there is misspelled -- there is no assurance that a site, even though it might be evaluated for residential use or residential risk, will ever become residential.

Land use, certain behavior patterns that we use in the risk assessments are, in fact, not well documented or not well confirmed. For instance, it would be very difficult to estimate what the accidental or incidental ingestion rate for soils might be for someone who is living on the site. If you go out and work in your garden on a regular basis, it's likely to be higher than someone who doesn't do yard work, for instance. But we try to make conservative assumptions about those behavior patterns.

Then for the transport models, we use mathematical models or computer models to try and project how contaminants move in different media; in groundwater how it might be dispersed through soils or how it might be dispersed in the air. Even how they might be dispersed in the air, being released into the air. Some of those models are more reliable than others.

We make every attempt, when we do these risk assessments, to quantify the toxic effects; in other words, to put a number to it so that we can compare that number of quantified risk to our benchmarks that we establish as being either safe or insignificant. This really isn't very helpful, but the important thing to note here is that the -- we basically divide toxins into two categories: carcinogens and noncarcinogens.

For carcinogens, we try to develop a risk factor. The risk factor is dependent to some extent on the dose that someone experiences.

For noncarcinogens, we call that benchmark a "hazard index" rather than a risk factor. But again it's dependent on the exposure dose. So in both cases the estimation of risk, or what we call our risk factor, for carcinogens or hazard index for noncarcinogens is based on the dose you know is being experienced by people on the site or near the site or the assumption that we made regarding the future potentials.

I want to point out the difference in the way we deal with carcinogens and noncarcinogens because, as this former slide indicated, we do treat them differently. (Indicating on displayed overhead chart), this is what call a dose response curve for carcinogen. The dose is on the bottom axis increasing to the right and the response, the risk of developing cancer, increases on the vertical axis. The graph, as you can see, is just what you would expect. As the dose increases, the response increases; the likelihood increases of experiencing cancer or contracting cancer. The important thing in this graph is that it goes through the "00" point. In other words, for any increase in dose above zero, there is some finite risk associated with that exposure. The only way you can have zero risk is when dealing with a carcinogen is to have zero exposure.

For a noncarcinogen, we have a different situation. As you can see, this is the same type of curve. Dose increasing on the horizontal axis and the response, whatever that response might be (liver damage or some other toxic effect), increasing on the vertical axis. But as you can see, that curve doesn't go through zero. There are doses below which there is no effect whatsoever. So the difference between a carcinogen and a noncarcinogen and the way we deal with carcinogens and noncarcinogens is that any exposure to a carcinogen carries with it some risk. Even infinitely small exposures carry infinitely small risks. But there are exposures to noncarcinogens which can be considered as having no effect whatsoever.

(Displaying overhead chart). This is a very brief synopsis of the assumption that we use in our standard risk assessment process for the soil and for drinking water exposure. The standard assumption for a child in a residential scenarios is that a child playing in the yard ingests 200 milligrams of soil each day. That child -- and the child is very often is the most sensitive receptor, so we use the child as a worst case scenario. If that child is in this part of the country, given that we have good weather down here, is in a contaminant area 350 days a year -- for percentages in particular, we assume that that exposure continues for thirty years. So even though that child may grow and still live on that same site, that exposure would continue for longer than just childhood. Our baseline criteria for carcinogens is a ten minus six risk level, which means an additional one in one million chance of contracting cancer. That other symbol there stands for "reference dose", the level for noncarcinogens from which you would expect no affect whatsoever to take place. For drinking water, as I touched on fairly briefly earlier, our standard assumption is that two liters of water are ingested each day, that the ingestion occurs 350 days a year -- there may be some days when the person is not at home. The same exposure period and the same criteria for cancer risk, the ten to minus six or one in one million. We also use drinking water standards to compare those levels of exposure. One of the other things that EPA does in addition to Superfund is regulate the public water supplies and drinking water standards have been set in that program. The acronym for drinking water standards maximum contaminant level is "MCL". When you see MCL, just think about drinking water standards.

Or, in the case of drinking water, we take twenty percent of the reference dose rather than the full reference dose because the assumption is that there are other routes of exposure by which people might be exposed to the same contaminant, and only a fifth of that should really should come in their drinking water.

That's the last slide that I have. The only thing I'd like to add to that before I turn this back over to Sheri is that in recent years, EPA has conducted the risk assessments ourselves. We use the data that the PRP's provide to us from their remedial investigation, but the risk assessment is done by EPA, by our contractors who are working directly for us and with overview and not work for the PRP's; so that we can maintain the objectivity and the consistency in those risk assessments.

So I'll be around to answer any questions with respect to the risk assessment process or contaminants after Sheri has shown you the rest of her presentations.

I'll let her come back up here now.

BY MS. PANABAKER:

I'd like to now go over the findings from the remedial investigation and look quickly over the objectives and characterize the data. We collect data and, as Bernie talked about, the baseline risk assessment.

During our remedial investigation, we looked at groundwater, soil, surface water and sediment. I'm going to go over each one of these in that order and talk about what was found. A total of thirteen groundwater monitoring wells were installed in three sampling events: one in August, September and December for a total of twenty-nine groundwater samples. The sampless were analyzed for approximately 150 different compounds, which included volatile organics, semi-volatile organics, metals and pesticides. The same 150 compounds were analyzed for all the different samples, soil, sediments, surface water and groundwater. In addition, some water aquifer tests were also conducted to determine the characteristics and direction of the groundwater flow and the speed of groundwater flow.

The next slide will show you were the monitoring wells were installed. The shaded areas are the trenches, the numbers up there with no "A" after them are the swallow wells that were installed, about ten to twenty feet below land surface. And the top -- and those with the "A" after it go to bedrock.

BY MR. JIM ROGERS:

I'd like to ask a question about the site. Can you tell me where Ledbetter Road is?

BY MS. PANABAKER:

Ledbetter Road is down this way, down here.

BY MR. ROGERS:

I'm still disoriented. My name is Jim Rogers. Could you tell me where my property would be. I think that it's the adjacent property there, but I can't tell from this.

BY MS. PANABAKER:

This is Ledbetter Road over here. Way down off the map, you've got Ledbetter Road going this way and White Horse way over there.

BY MR. JAY ROGERS:

And North is straight up?

BY MS. PANABAKER:

North is straight up.

BY MR. HAYES:

You can see the little creek that runs down to the east and the other little small creek on the south.

BY MR. JIM ROGERS:

I can't identify it from the map there. I am interested in where your monitoring wells are.

BY MS. PANABAKER:

This distance is 50 feet, these are 30 feet and these are about 125 feet, 125 from this area to here (indicating).

White Horse goes here and 276 is here (indicating).

BY MR. JAY ROGERS:

I can show you where -- my property is right here.

BY MS. PANABAKER:

On the other side of the creek?

BY MR. JIM ROGERS:

Down by the creek.

BY MS. PANABAKER:

This is the distance from -- this shaded area and this (indicating). This is about thirty feet and these are about one hundred twenty-five feet, 125 in this area here (indicating). White Horse here and Ledbetter better. Along that edge. I can't go from where you'all have ---

BY MR. JIM ROGERS:

I still can't tell where my property is.

BY MS. PANABAKER:

By the creek? On the other side of the creek?

BY MR. ROGERS:

(Indicating on map).

(GENERAL REVIEW TO LOCATE PROPERTY)

BY MS. PANABAKER:

The contaminants of concern were trichloroethene which is also known as TCE, manganese and possibly bis(2-ethylhexyl) phthalate. The reason I have "possibly" up there is that it was in the first sampling event it was in two wells and it was in one well the second sampling and it wasn't detected at all in the third sampling. These wells were located onsite approximately 30 to 50 feet from the trenches. We plan to do future sampling to determine if it is within the concern or not. The water would be flowing in a northeasterly direction towards the little creek that is that way.

The TCE and bis(2-ethylhexyl) phthalate was detected in two wells during the first sampling, but only in one well on the next sampling or the second sampling. It was not detected at all in any well during the third sampling.

The other hazard, which is a noncarcinogen, was manganese and it was above risk-derived number, exceeded the risk number that was derived in the baseline risk assessment, in five of the thirteen monitoring wells.

Also during the remedial investigation, forty-three surface and subsurface soil samples were collected and analyzed for the same 150 compounds that the groundwater was analyzed for. These were collected from inside and around the previous trench area or below it, as well as from around it. These figures (indicating displaying slide) show that these are the surface water samples, this are the soil samples up to one foot below ground surface.

BY MR. GARZONE:

Excuse me. I have a question. I'm Mr. Garzone and I live on Keeler Mill Road. Mr. Rogers had a good question. I can't relate to the position of the contamination with where my property is located. I would be on the North side of Keeler Mill Road.

BY MR. HAYES:

I don't know if this would help but this is little bit larger scale map. It does show Ledbetter Road, but it doesn't show much more than that.

BY MR. JIM ROGERS:

Well, the one thing for me, and I'm sure for most of the people who are here tonight, they want to know how close they are to the problem area.

BY MR. GARZONE:

I want to know how far I am from the ---

BY MS. PANABAKER:

I can't tell you that. What I can tell you is that we're going to go over, from the findings, -- the soils don't have any, so the groundwater samples only -- the area thirty to fifty feet away. This area here is about twenty-six acres and it is about from here to here (indicating).

BY MR. GARZONE:

At the end of my property -- I have twenty-one and a half acres along Keeler Mill and go back all the way to ---

BY MS. PANABAKER:

This property line, this is the back property line. This whole area here is four acres or so. This is the property bounds (indicating). There is a creek here, a small creek, which start right over here right near the edge of the property.

BY MR. HAYES:

Here's the scale so you can see that the trenches are maybe two hundred feet from the property line.

BY MR. GARZONE:

The reason I want a good map is ---

BY MR. HAYES:

We probably don't have a better map.

BY MS. PANABAKER:

I don't know but I am guessing that this property line -- the site property line is right behind there.

BY MR. GARZONE:

See, I can't visualize that. I am thinking that I am right in here (indicating).

BY MS. PANABAKER:

Right over here (indicating), right up in this area.

BY MR. JIM ROGERS:

Do you have any sort of designation from the county tax maps or something as to what this piece of property is, so that everybody can compare their property with that? How big a radius is that?

BY MS. PANABAKER:

I don't know.

BY MR. HAYES:

I think what we probably need to do is get that a reference for the County tax maps so that we can send it to people and let them know exactly what piece of property is involved, and maybe develop a bigger figure that shows this property in relation to property around it. Send it to you'all or somehow let you'all know about it. I don't think we have a better figure here to show how it relates to surrounding property. But we can take that back with us and let you'all know a little bit better about ---

BY MR. PANABAKER:

You guys have got a sign-up sheet over here.

(GENERAL DISCUSSION AMONG ATTENDEES)

BY MR. COGDILL:

When were they out there?

BY MS. PANABAKER:

Well, they start at 6:00 in the morning and work until late at night. We have an EPA officer out there representing us, overseeing the work, so they did not "sneak" it out with EPA watching them.

BY MR. HAYES:

Let us go ahead. We will have a question and answer period.

BY MR. PHILLIPS:

They never -- I live right on top of it. I'm not a hundred feet from it.

BY MS. PANABAKER:

Well, maybe if I could finish first and then we'll answer any questions that you have.

(GENERAL DISCUSSION AMONG ATTENDEES)

BY MR. HAYES:

We'll have a question and answer period at the end and we'll ---

(GENERAL DISCUSSION AMONG ATTENDEES)

BY MS. PANABAKER:

Well, let me finish my presentation and I'll answer your questions.

Also, I'll need to have you'all stand up and give your name when you ask the questions because we have a court reporter here.

These are the locations of the subsurface soil samples and the last one shows the surface soil.

The conclusions from the soil investigation were that the site soils were no longer adversely affected by the previous waste disposal. And that the earlier remedial action that occurred in 1990 by the PRP, overseen by EPA, was very effective.

The risk assessment determined that there was no unacceptable carcinogen or noncarcinogen risk within the acceptable human health risk range.

There were also surface water and sediment samples taken from the creek located north of the site, as well as the little creek south of the site and also east after they came together. A total of eleven surface water and five sediment samples were collected and analyzed again from the same 150 compounds. Show the next slide.

Sediment and surface water samples were collected from the same place for the most part. These two are your background (indicating). Then we took additional samples here and here, further down here and then further down to the east after the two creeks flowed together. These are sediment sampling points. They are the same locations, except for "6", but there are five of those.

The conclusions from the surface water and sediment investigation were that the creeks were not adversely affected by the site. There were low levels of TCE found in the north creek, but they were way below the level of the Federal water quality criteria.

The conclusion from the baseline risk assessment was that there was no unacceptable current risk and that the only risk was for a potential future resident -- that if the land were developed, like Bernie said, for further residential use, if an on-site resident was to move there and install a private well.

The objectives of the feasibility study, as it says up here (indicating on slide), is to characterize the type and quantity of contaminants and then view the baseline risk assessment to determine exposure, calculations and all that Bernie talked about earlier to determine the risk to human health and the environment.

From that, you determine what you need to have EPA clean up, and it was determined that the groundwater was the only media that needed to be remediated.

So the next step in the feasibility study is to then advise the community and advise remedial technologies for any remedial efforts; in this case, groundwater.

Also during the feasibility study, remediation goals and levels were determined to determine how clean the groundwater would be.

After looking at a lot of technology, you narrow it down to a list that you think will actually work at the site and are implementable and feasible and meets alternatives that compare to each other against the nine criteria.

These nine criteria are broken into three groups. The first two criteria up there are "Overall Protection of Human Health and the Environment" and "Compliance with Applicable or Relevant and Appropriate Requirements" are what we call threshold criteria. The final alternatives in the FS must meet these first two criteria up here. Applicable or Relevant and Appropriate Requirements (also known as ARARs) and an example of one of those would be a state drinking water standard or a federal drinking water standard.

The next five:

Long-Term Effectiveness,
Reduction of Toxicity,
Mobility and Volume,
Short-Term Effectiveness,
Implementability and Cost

are considered balancing criteria; and the final two, State Acceptance and Community Acceptance are what we call our modifying criteria.

The results of the feasibility study show that there are four alternatives or that we had four alternatives.

The first one, "No Action", is required to be in all of our feasibility studies. It is used mostly just for comparison of the alternatives against that one. If we did nothing at the site, no remedial action whatsoever.

All of these costs are including thirty years of monitoring the groundwater from the on-site wells for all of the contaminants of concern, between two and four times a year.

The second alternative up there is Institutional Controls and that would be using deed restrictions and access restrictions.

The remaining two alternatives all include the groundwater monitoring and they also include the access and deed restrictions of alternative two.

The third choice is in-situ air sparging. This would be using trenches or wells. The trenches would be dug, one trench or more and that would be determined by the design, and a slotted or perforated pipe would be laid in the ground, surrounded by gravel. Then the air or nitrogen would be pumped through these pipes, which would then cause the air to come out of the pipes and go through the groundwater via bubbles and take the organic contaminants with it. They would then come out of the groundwater and go into the atmosphere. Since we have fairly low levels of TCE and the other contaminants in groundwater, there would not be high levels of organic contaminants going into the atmosphere. We would take care of the manganese, because at this time it is naturally occurring in the groundwater but for some reason has then time has become insoluble. That means that it is not dissolving into the groundwater. With pumping air down there, we could cause the manganese to go back into the soils.

The fourth one is groundwater extraction and treatment which would require the installation of a treatment plant and the discharge of the cleaned up water into a nearby creek or into an infiltration trenches; which then can be trenches dug, letting the water infiltrate back into the soil.

The remediations level established for this site were the following: For the manganese, there is no drinking water standard, so the cleanup is at the baseline of this assessment. That was determined to be part 180 parts per billion. The highest detected was 1.39 and that would take the risk down to below one, which is the limit. The TCE was violated. The 180 is the highest detection that has been detected.

The detection level is 0.010.

At this time EPA's preferred alternative is air sparging, which is air and nitrogen which creates bubbles and causes the manganese to redeposit back into the soils, where it is naturally occurring.

The reason also that EPA feels that Alternative 3 is our best choice at this time is that "No Action" would not take care of the problem at all, because we would not be doing anything out there. Alternative 2, Deed Restrictions, does not satisfy EPA's statutory preference for taking an active remediation.

Alternatives 3 and 4 both do, but when we were out there doing the remedial investigation, we found that there wasn't a lot of water flow from the aquifer in that area. We had sixty foot wells that we pumped dry in six gallons, so we did not really feel that we'd have a steady flow of water to use in treatment.

At this time I'll open it up for questions. But I do ask that you state your name and then your question.

<u>BY MR. JIM ROGERS:</u>

My name is Jim Rogers and I have a couple of questions as far as what is the possibility of getting the PRP test on the adjacent property, in view of the fact that there has been groundwater flowing away from the site? And where do we get this PRP? The third question is what, if any, -- if you chose to go with Option No. 3, once that process is instituted -- sparging, is that what you called it?

BY MS. PANABAKER:

Insitu air sparging.

BY MR. ROGERS:

Once that's completed, are there any plans for future monitoring of the site, and do you have an approximate time for Option 3 and Option 4?

BY MS. PANABAKER:

That's a lot of questions. The first one is that the private wells were sampled earlier and no site contaminants were detected in those wells.

BY MR. JIM ROGERS:

I'm sorry, private wells were sampled in the past and no contaminants were detected in them?

BY MS. PANABAKER:

Private wells were on the site and were sampled in the test and no contaminants were detected in them. These (indicating) are the two wells that had TCE in them, these did not, down here. It had not gotten that far, we don't believe it's gotten further here, especially with combining that with the fact that the private wells around the site over here and over here were sampled and no contaminants were detected.

BY MR. JIM ROGERS:

You're saying in your conclusions that the groundwater was flowing northeast?

BY MS. PANABAKER:

That's correct. But these wells were sampled and there was no TCE in this.

BY MR. JIM ROGERS:

When?

BY MS. PANABAKER:

This past summer and this last December. Six months ago. It was also determined -- I guess that I should mention this, that the contamination is moving about five feet a year. Period.

I can't remember all the rest of your questions.

BY MR. JAY ROGERS:

The second one is just how you go about getting the RP?

BY MS. PANABAKER:

It is in the feasibility study report. It is there right now, in the Travelers Rest Library in the Information Repository. There is a remedial investigation and a feasibility study report. It's there right now.

BY MR. JIM ROGERS:

My third question was, once that you finish, will you go with Option No. 3, once you complete that?

BY MS. PANABAKER:

Um-humm, (affirmative nod). We would continue monitoring. There is a five-year -- EPA has a five-year commitment to check on technology.

BY MR. HAYES:

At least a five-year period.

BY MR. RALPH PHILLIPS:

My well is not a hundred feet from where they dumped that toxic waste.

BY MS. PANABAKER:

I need you to stand and give your name. I can't really hear you.

BY MR. RALPH PHILLIPS:

I am Ralph Phillips, 480 Ledbetter Road. My well is not a hundred feet from where they dumped that, and my well has never been checked.

BY MS. PANABAKER:

I don't know where your well is but I know they checked about five wells right around the area, and they did not have anything in them. And the nearest one ---

BY MR. RALPH PHILLIPS:

I don't live a hundred feet from where they dumped the toxic waste. I know when they come and I know where they dumped it. And my has never been checked.

BY MR. HAYES:

It is possible that some wells could have been missed during the well survey. One of the reasons we want to get your name and address is so that we can call you back and find out right where your well is located. If we need to come out and check it, we will do that.

BY MR. RALPH PHILLIPS:

They came out one time -- EPA came out one time, they took a picture of my well but they did not take any samples of my water. I'm not a hundred foot from where they dumped it. I know when they dumped it. I know where they dumped it and everything.

BY MR. HAYES:

Your well probably needs to be checked then if it hasn't already.

BY MR. RALPH PHILLIPS:

Well, it sure does need to be checked.

BY MR. HAYES:

So we need to get your name and address and phone number so we can find out if in fact it does need to be checked.

BY MR. DONALD COGDILL:

We ---

BY COURT REPORTER:

I need you to stand up and tell us your name.

BY MR. DONALD COGDILL:

Donald Cogdill. I hear rumors that there is a toxic waste site over in that area that needs to be checked, which is behind Frank over there.

BY MR. PANABAKER:

If you would, come up afterwards and give me some information and we will pass that information on.

BY MR. DONALD COGDILL:

I remember when -- there have been numerous people saying that there -- where Mr. Henry Pritchard was living down on the river, Slopetown Road, he owned the property right under the power line where they are building, and they just dumped a whole -- stumps, trash and -- and there are rumors that there's toxic waste under that, which it needs to be checked.

BY MR. RALPH PHILLIPS:

EPA was right out here year before last. They had trucks. They pulled them out, they covered them up early in the morning. The guys had white suits, white hats, white boots and everything. They was covering them trucks up and moving them out early in the morning. They dumped right below my house, on Rochester property. I know when it happened. I reported it to News 4. News 4 came out and had the report on it. And it's not a hundred and fifty feet from where I live at. They never came out and checked my well. They never came out and done nothing. And I know when it happened.

BY MR. HAYES:

Well, I think that we probably need to get back in contact with you about your well. As far as other waste sites that might exist out there, the only way we know about them is if people report them. If you want to give us some idea of where you think there has been some other disposal activity, as Sheri said, we will go back and report it to the people who do the site investigations for us, and let them come out and try to take a look at it. I can't say there they will be out there immediately or anytime soon, because we've got a huge list of sites that need to be done, but we can report it to them and let them get to work on it.

BY MR. DONALD COGDILL:

I am not saying that it is confidential rumor (sic) but there is a dump site there.

BY MR. RALPH PHILLIPS:

The one that you're talking about on that property is not a hundred and twenty-five feet from where I live or where my property is, where my well is at.

BY MR. HAYES:

Well, as I mentioned, your well should have been checked. If it hasn't been checked, we will check it.

BY MR. RALPH PHILLIPS:

I know who dumped it, I know where it came from. I can't prove that, but I know. And my well has never been checked.

BY MR. DAVID TOWERS:

I'm David Towers and I'm interested in knowing all the PRP's who are participating and if they have agreed to Alternative 3, or is that something they're going to have to be sold on?

BY MS. PANABAKER:

The PRP's at the present time are -- like I said, again, there really weren't a whole lot of choices. There were just the four choices. The pump and treat, which is a fairly common alternative at numerous sites, we just weren't sure would work at this site. We just didn't have the water. It wasn't flowing enough that we thought that we could extract without putting -- to keep it pumping. So, yeah, they really are agreeable with this alternative.

BY MR. HAYES:

Let me point out a little bit more about the process. The PRP's agreed to provide you with the data and an evaluation of alternatives. We take that data to EPA and we essentially make the decision independent of the PRP's and find out what the best alternative for the site is. We then, give the PRP's the opportunity to implement that alternative. It's not a question of it being "sold" on them *per se*. We simply say, 'This is the best alternative, based on the data that you've given us. You can implement it or we'll implement it.' We give them the opportunity to do it. It's not a question of we suggest it and try to sell it to them. The process really is that we decide what the best alternative for the site is, and then give them to opportunity to implement it.

BY MS. PANABAKER:

Did you have a question?

BY MR. GARZONE:

When they decide on the alternative to correct it, are they going to do the right thing to correct it or are they going to do it just to the extent to what they can afford to correct it?

BY MS. PANABAKER:

No. It'll be done until it's cleaned up. Like Bernie just said, if the PRP doesn't do it, then EPA will do it.

BY MR. JIM ROGERS:

I have a couple of questions. My name is Jim Rogers. As I said, I think I'm an adjacent property owner. I can't tell from the map. I've got two questions. One is that I might actually have been damaged and, two, the perception of being damaged. I'm concerned whether or not monitoring wells can be drilled up and down my property line to see if there is any flow in that direction -- any contaminants. When you talk about sampling wells there, and there are people actually using those wells. I am talking about monitoring the wells so we can see if there is any groundwater flowing a couple hundred feet from my property line. I'm concerned about, one, actual contamination as an adjacent property owner. The other thing I'm interested in is the damages. Being an adjacent property owner, I'm concerned about the damages, real or imaginary. When I say "imaginary", I own fifty acres of land and it's sitting next door to a Superfund site that's been investigated and mediated to the tune of $3 Million. When I go to sell my property, what is my prospective customer or purchaser is going to think? Is he going to give me full price for my property? He might say 'but you're connected to a Superfund site.' So I'm asking are there any remedies, legal or otherwise, for an adjacent property owner?

It's just like having a run-down house in the neighborhood. Two or three houses get run down, you're not going to get full value for your property.

All of us in that immediate vicinity, no matter how much we talk, until we're blue in the face, if that Superfund site because EPA has said that it as, has studied it for ten years, and you've got thirty years worth of monitoring, or you're going to put deed restrictions, you know, are we going to get the value for our property?

Like I say, we are talking about the fifty acres. Well, we might get $2,000 an acre for it. My whole piece of property is worth $100,000. If we're talking about spending $3 Million dollars to get rid of a few organics or a landfill. We're spending tremendous amounts of money to clean up this forty foot long trench, three foot wide, six foot deep, three or four of them, $3 Million for all that. We, as property owners near a Superfund site, are damaged. Is there any recovery for that?

BY MR. DAVIS:

I'm a lawyer, not a real estate broker. I can't ---

BY MR. JAY ROGERS:

But would you have an opinion on that subject?

BY MR. DAVIS:

This is a site that is -- if we had remediation done out there and the source of the contamination was taken out of there. We don't have a whole lot left out there. What we do have is groundwater contamination. That groundwater contamination is within the site property and certainly within the Rochester Property. So it has not gone over, to my knowledge, the adjoining property. It has not gone over into any of the other adjacent properties. It should not have any detrimental effect to the value of your property. That doesn't mean you're going to have a good bit of perception out there.

BY MR. JIM ROGERS:

Is there a line or something where they can say that at that point that it is ---

BY MR. JAY ROGERS:

What about if you did that and you got the PRP's to foot the cost of putting in monitoring wells basically for all of the adjacent property owners as a part of their remediation package at the conclusion of it, so that at least the adjacent property owners would have a 'certificate' of some kind at the end of it saying these tests were done and came up clean on our property.

BY MR. DAVIS:

We have done that to a certain extent. You can see that these monitoring wells kind of form a arc. There is an inner arc and an outer arc. They were configured that way because we knew that the groundwater was flowing that way. So we kind of put out a net of monitoring wells to see how far north had they gone and how far this way have they gone. This outer net, we only got to see -- there was only one monitoring well with very low levels of TCE. From that information we can discern ---

BY MR. JAY ROGERS:

Do you know offhand what would be the approximate cost of doing what I'm talking about? Because, I understand, you see the groundwater moving in that direction, and it makes the most sense to test there.

But, again, we're talking about perception as much as anything else. If you actually have a piece of paper in your hand where you can show a prospective client these tests were done on my property and they came up clean, it might give people who live around there a lot of peace of mind as far as re-sale of the property. I don't know the cost. Cost may be prohibitive, but it may minimal. I don't know what the cost of putting in a monitoring well is, but you're talking about $2.5 to $3 Million and an extra well may be $50,000 to do this. That would seem like a pretty reasonable additional step to take.

BY MR. HAYES:

Let's put aside the question of the cost of monitoring wells and monitoring, because while compared to $3 Million, to put in a monitoring well may not be that expensive, there is long-term cost of sampling and going out there, and having people go out. It could run into considerable expense.

What EPA has already said, and I go on record tonight, that's one of the reasons for us doing remedial investigation feasibility studies is that the site poses no risk to current receptors. And that the only way it could be a risk would be if somebody put in a well in the area where we know the contamination now exists, which is very limited.

Now the remedy is to go in and clean up that area we know is contaminated before it goes any further.

Essentially, what you're asking the EPA to do, we've already done.

We've said that the site under current conditions, poses no acceptable risk. Only under the potential future use of someone living on the site and putting a well in the groundwater on the site, could there by any potential adverse health effects.

We are going to clean up, even based on that. So the whole record of the remedial investigation and the baseline risk assessment serves the purpose that you're asking us to further provide, or that you would ask the PRP to provide.

But what you and the PRP may decide to do between yourselves, outside of the regulatory environment EPA provides, that's something we don't have anything to do with.

In terms of what our authority to accomplish is, you know, we have investigated the site to the best of our ability, and we've put in monitoring wells in those locations where we would most reasonably expect contamination to be.

We found some in a limited area and we're going to clean that little limited area up and go on the record saying that there is no other risk. So that, in and of itself, should provide some certification to the property that you're asking for now. Separate operations or a separate document or a separate endeavor on EPA's part to certify that the adjacent property owners are somehow -- or, somehow that the adjacent property is not clean is just not something we do. It is not in the nature of a regulatory agency.

BY MR. RALPH PHILLIPS:

Why did they try to hide it when they buried the trash out there, to keep it from everybody out there? Why did they try to hide it?

BY MR. HAYES:

Well, I can't answer that. I certainly can't answer that.

BY MR. DONALD COGDILL:

What year were you'all ---

BY MS. PANABAKER:

1972, '71 and ;72.

BY MR. RALPH PHILLIPS:

I know when they tried to clean it up too. I mean we've got wells there. Our kids are subject to that well water. How do we know it's clean and whatnot? They kept it hidden from us.

BY MR. DONALD COGDILL:

You have run a survey. If you got the majority of the people around there -- I am telling you the gospel. I've got kids and I don't think that they should be subject -- that is not right, by no means. I don't care what nobody says.

(NUMBER OF PARTICIPANTS TALKING AT ONCE)

BY MR. GARZONE:

This monitoring, how often do they check the well? The well could be good one week and maybe two days later it could be contaminated.

BY MR. RALPH PHILLIPS:

Mine has never been checked.

BY MR. GARZONE;

Is it a weekly check? One week the well might be good and then two weeks later it might be bad. When do you get the bottles from the EPA? They only give you one bottle at a time.

BY MR. HAYES:

They only give you one of those because they've cut down on their cost.

BY MR. GARZONE:

If it is not monitored once a week, how often is it going to be?

BY MR. HAYES:

Well, there are two things there. The first time is the frequency of monitoring. Nobody has decided even if monitoring wells would be monitored. That's a part of the remedial action. One of the things that we are here for is to find out the concerns of the people around the site. If you'all think that remedial action goes far enough. So the question of whether or not the private wells should be monitored, and how often, is a comment that we will take back and consider and could potentially incorporate into the remedial action. So we don't have an answer as to how often that would be monitored or even if they would be monitored as a part of the remedial action. But the action that you'all feel that it should be done is something that we should take back and consider before me make the final decision.

Now, the other part of it is -- you're right -- the quality in a well, the quality of the water in the well changes constantly. That change could be as a result of contamination in the groundwater, it could be just natural changes that occur over time. It could be deteriorated of the well, it could be deterioration of pipes in your house, but it does change. But the thing to keep in mind with regard to the frequency of the sampling is that at the very low levels of contamination that we have at this site, even if it were exposed, of the contamination that exists on the site, the only health affects that would occur would be with exposure over a long period of time. So if you monitored, say even quarterly, even if the well changes the day after you monitored it in the first quarter and you were exposed to three months of that concentration because it was actually detected, the health effects associated with a very short exposure period are insignificant.

Even public water supplies, like city water supplies aren't monitored, except for bacteriological contamination but once a year or sometimes once every three years, because the health effects of the contaminants that are normally found are only a problem over a very long period·of exposure.

So to monitor once a week, you might actually end up generating more data than you'd know what to do with, because it's going to bounce all around. You really need to be concerned about the long-term exposure and less frequent monitoring is probably going to give you a pretty fair idea of what the long-term exposure is.

So while monitoring the water is a good idea, obviously cities do it, towns do it, when they run water supplies, and maybe it's something that needs to be done as part of this remedial action. That's something we can consider when we go back. But doing it weekly, even monthly, you're probably not going to protect your health any more than doing it quarterly or even semi-annually.

BY MR. GARZONE:

I have another question. It's related to what Mr. Jim Rogers said, which is very important. How do we get the true -- in other words, when you go to sell property, number one, people are going to be aware of this. People are going to be more conscious of the property. How are we going to get -- say I wanted to get a true exposure -- in other words, when I sign a contract or I find a mortgage on a house, maybe they will give me $50,000 and then he comes up and sues me, the truth of the disclosure was that you told that your property was not affected. The guy can stop payment on the house that he bought from me if -- and prospective builders are that way. If they build some house, they could be in a lot of trouble also, that whole are. This is going to separate -- he or she is going to be very fortunate that they own the property, especially when talking about long-term protection. Thirty years ago ---

BY MR. JIM ROGERS:

It is like putting a huge landfill next to your property, that you did not ask to have put there. It's a hostage situation.

BY MR. DAVIS:

One way to provide some certainty to a seller is to have an environmental audit done on your property. Have a private company come out and take some soil and take some soil samples, take some groundwater samples and do their own testing of that soil and groundwater. They come back and give you their report and give you a clean bill of health. You can get some assurances from that company that what they've told you is fair and accurate.

If they're wrong, you are going to have a recourse against that private company that did that testing.

BY MR. DAVID TOWERS:

How does one go about amending the proposed plan to incorporate Mr. Rogers' suggestion?

BY MR. DAVIS:

During the public comment period, just submit written comments to the address on that Proposed Plan Fact Sheet that you received tonight.

BY MR. HAYES:

Let me just real quick -- I know that this does not help you'all too much in your specific situation. But it is not like this doesn't come up at other sites, similar situations. There is another Superfund site not too far from here where essentially the people are in exactly the same situation. One of the person living near this site bought the property not knowing that the disposal site was nearby, and felt like it had not been represented to them fairly -- it had not represented that the site was there. Well, the only thing we could tell those people is what we're telling you now is that our investigation, that the risk assessment didn't show any reason why they shouldn't have bought the property or any reason why they are at any risk when they bought the property.

That doesn't mean that that person can't turn around and sue the person that sold them the property because they think they have been damaged. There is no way that we can prevent that from happening because that's a person's choice. But what our goal is, is to state the facts of what we found about a site. In that case, we were able to tell the person who had already purchased his property, but prospective purchasers of adjacent parcels that were subsequently for sale, the same thing. Our investigation didn't find any reason for them to be concerned about the property they purchased or that a prospective buyer -- we told them, 'There is no reason for you to be concerned, there isn't any problem.' We can't do any more than that. We would be overstepping our authority and we would be interfering with the transactions that you'all might want to make; and, you know, we have no business interfering.

BY MR. GARZONE:

We expect you people to be EPA doing their job, but you are automatically interfering. See, we can't escape you people. No matter how lucky I am, it would cost me thousands to get a declaration of truth agreement and -- you are a big operation. It's the government that's is supposed to do all these things. So we're locked into it. We can't get away from the fact. We're not immune from the publicity and the information that's available for the public. Everybody has become an expert. Especially -- everyone loves to sue each other, especially the person with deep pockets. If a person has no money, they don't bother because there is nothing there to take. But if a person has got money, if he sells property, they're going to go after him.

BY MR. JAY ROGERS:

I understand you can't go out there and wipe out the perception that people have once they hear the words "Superfund". All that you can probably do is what you are suggesting, is that -- something along those lines. But I guess the bottomline becomes who pays for that. It seems to me, why not package something like that in when you settle it to the PRP's rather than making my father and all these other people have to go out and hire a firm to do it that costs them several thousand dollars -- even though that's what he does for a living. It would be business for him, but he shouldn't have to pay for it and these other people shouldn't have to pay for it.

BY MR. DONALD COGDILL:

That's right.

BY MR. JAY ROGERS:

I could write him a letter, you know, and try and twist their arm, you now, because I'm an attorney but if you guys, the Feds, lean on them, it seems to me it's going to be a lot easier.

BY MR. DONALD COGDILL:

We should be tapped into city water if the water shows as contaminated. We should be tapped in free, because the people who live up there cannot afford to have that water line tapped in. We have got natural spring water.

BY MR. RALPH PHILLIPS:

If they dump on your land, it's already ruined the property of your land. Who do you think is going to pay land with a toxic waste dump on it?

BY MR. DONALD COGDILL:

The word has spread around so much in that area, it's got so far around that it has depreciated the property and devalued the property.

BY MR. HAYES:

Well, the suggestion of, as part of the remedial action, hooking residents up to public water is the kind of comment that we want to hear. It's something that we can consider in making the final decision on the site. The purpose of this meeting is to hear those comments.

BY MR. JIM ROGERS:

I've got fifty acres. Are you going to give me fifty tap so if I develop the land?

BY MR. HAYES:

The answer is 'probably not.'

BY MR. JIM ROGERS:

That is what I expected.

BY MR. DONALD COGDILL:

A lot of people are having stomach problems, a lot of kids are having stomach problems. That is true.

BY MR. DAVIS:

This is the kind of things that we will take into consideration when this final decision is made about the site. So to tell you we're going to do this, that and the other, provide public water to any particular person, in any particular fashion, is not something we're prepared or that we are really ready to tell you at this time.

We can tell you what remedial action that we see at this point in time is going to be based on the data that we have now.

Certainly all the comments that have been made with respect to, whether it be monitoring or some kinds of assurances for additional property owners, are the kind of comments that we want to hear so that we can go back and discuss them and see if the circumstances warrant remedial actions.

Otherwise, there is really not anything that we can promise you or tell you at this point.

BY MR. WAYNE HAWKINS:

Basically, what you're telling us, then, is that we're only concerned with the groundwater?

BY MS. PANABAKER:

Can you say your name real quick?

BY MR. WAYNE HAWKINS:

Yeah. Wayne Hawkins, 304 Ledbetter Road.

BY MS. PANABAKER:

Groundwater is the only concern of this meeting.

BY MR. HAWKINS:

I've got another question. A while ago you mentioned something about the movement of the contaminate. Run that by me again.

BY MS. PANABAKER:

It's moving in a northeasterly direction at about five feet a year.

BY MR. HAWKINS:

The blue marks, is that where the movement is?

BY MS. PANABAKER:

No, we did not mark it in the field.

BY MR. HAWKINS:

I was just curious. What I am getting at, again, is the direction that it was going -- which is easterly towards my well.

BY MS. PANABAKER:

It is moving towards that creek up there on the right side.

BY MR. HAWKINS:

I know right where you're at. Again, the movement of it, as you described, it is moving -- well, there are several wells down that way.

The cleanup that you are proposing to do, is that going to stop that movement?

BY MS. PANABAKER:

Yes, it tends to stop it from further migrating, as well as to clean it up.

BY MR. HAWKINS:

What about over a number of years, that stuff has already moved. How do you ---

BY MS. PANABAKER:

Um-humm, (affirmative nod). The intention is to stop it from further migrating, as well as to clean it up. We know pretty well the extent of contamination at this point.

BY MR. HAWKINS:

I guess what I'm asking is, with the clean up that you're going to do, the movement to this point, that will stop any further movement, as well?

BY MR. PANABAKER:

Once the line are -- but we are going to sample those other markers. We will keep an eye on where the contaminants are.

BY MR. LYALS:

Joe Lyals. If the remediation Option No. 4 is more effective at stopping the migration of the contaminants in the groundwater, that you're actually causing back pressure by taking the water and stopping it in its tracks, stopping it in its tracks, digging trenches and it's gravity flowing into the trenches. If you dig the trench wide enough and deep enough and it enters the aquifer, ---

BY MS. PANABAKER:

It would intersect the aquifer where we found -- remember the TCE was only found in the water table wells and not in the deeper ones, the first ten to twenty feet below ground surface in the first ten feet or so of groundwater? Also, the flow won't really take care of the water or the contaminants in the water. That aquifer is so tight that we could dry up 60-foot wells in six gallons. That is not very much, so that is another reason that we looked for an alternative treatment.

Any more questions?

BY MR. JIM ROGERS:

Have you got any experience with depressed values? Do you know of any legal remedies for recovery of depressed values?

BY MR. DAVIS:

It's hard to -- I don't know how soon you're willing to sell your property or whatever you're going to do on your property, but up to this point, you don't have any contamination on your property. We haven't found any contamination on your property. Otherwise, if we did, you would have the authority to go and say to the PRP, "Listen, clean up your property so that it will be whole again." Up to this point, we have found no contamination on your property. So other than the perception that you are next to a Superfund site, you have no action under the law.

BY MR. JIM ROGERS:

That is enough.

BY MR. HAYES:

The perception depends on who you're talking to, I guess. A lot of people out there in the real estate market are not fazed by the fact that the property is adjacent to a Superfund site. I got a call from a real estate broker five days ago and he is eager -- he has a client who is eager to buy property that is part of the site.

If there is not anything out there on your property, you can go so far as having an environmental audit done on your property that is going to give you the certification that you need to go to a prospective buyer and say, 'Listen, I've had no contamination out here.' This site is -- compared to most sites, this site is very low-level risk. I mean, there just is not much out there. We did a removal and removed all of the waste out there and that took care of the majority of the problem. This is just kind of the last final steps to ensure that there is nothing out there.

BY MR. JIM ROGERS:

I understand. I am an Environmental Engineer. But it is the perception. We really have had some plans of developing this into a subdivision, residential subdivision. This poses a -- it a real problem in that I submit the real estate man was to provide a Superfund site. People around here are not that gung-ho on Superfund sites. They are not going to buy that first. With that perception, I realize that it is just parts per million or parts per billion but that perception is just destroying us. It seems unjust that this is being pushed on us. It is taking the property -- and I just thought that you might have some legal theory of somehow we might pursue this.

BY MR. HAYES:

I am not a private attorney going after entities.

BY UNIDENTIFIED SPEAKER:

EPA doesn't have any money and they're going to send $3 Million Dollars on this, out of this little-bitty pockets.

BY MR. HAYES:

We've kind of beat this subject around. You may have some very valid points about taking issues and about what may be accessible to you through the courts, but what you have to understand is that EPA is a regulatory agency and our authority is limited. Our authority is to protect human health and the environment from the effects of contamination of the site. That pretty much the length and breathe of it. Our authority does not extend to providing some kind of compensation for damages associated with the perception of a Superfund site, which are understand they are very real. But I don't think that -- to be honest, even working at the EPA, I don't think I would want EPA's authority extended that much, where we would start dealing in those kinds of issues. I think it's better that our authority is limited, strictly dealing with the impacts of human health and the environment associated with the contamination of the site and making sure that the people responsible for that clean it up.

The kinds of things that you're suggesting that we get involved in it and we try to accomplish, I think you just have to accept that we don't have the authority to do.

BY MR. JIM ROGERS:

I was really more concerned if you know some legal issues, not so much EPA but in your experience with other Superfund sites, how have they recovered?

BY MR. HAYES:

In response to that, I want to say that at other sites I have had some experience with, the only time that I've been involved as a project manager in those kinds of issues, is when one party or the other comes to me and says, what is the data that EPA has and what conclusions has EPA reached on that data, and not getting directly involved in certifying the adjacent property is clean or not clean, or trying to make some kind of judgment and determination about damages to the adjacent property. In that sense, my own involvement as an EPA employee has been to provide the data that I have. To go beyond that would be, I think, overstepping the authority of the agency.

BY MS. PANABAKER:

Are there any other questions? I'm going to conclude tonight. If you want to see me, I'll be here for a little while afterwards and answer any other questions. Thank you.

State of South Carolina)
County of Greenville)

This is to certify that the within Public Hearing and Comment Session was held on June 28th, 1993.

That the foregoing is an accurate transcription of the presentations, including question and answer session,

That no exhibits were entered of record;

That the undersigned court reporter, a Notary Public for the State of South Carolina, is not an employee or relative of any of the parties, counsel or witness and is not in any manner interested in the outcome of this action;

IN WITNESS WHEREOF, I have hereunto set my Hand and Seal at Greenville, South Carolina this 17th day of July, 1993.

Commission expires: 1-10-2001

(SEAL)

APPENDIX B

STATE OF SOUTH CAROLINA CONCURRENCE LETTER

ROCHESTER PROPERTY SUPERFUND SITE

South Carolina
DHEC
Department of Health and Environmental Control
2600 Bull Street, Columbia, SC 29201

August 25, 1993

Mr. Patrick Tobin
Acting Regional Administrator
US EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

RE: Final Draft Record of Decision (ROD)
Rochester Property Site
Greenville County

Dear Mr. Tobin:

The Department has reviewed, commented on, and concurs with the Record of Decision (ROD) for the alternatives selected for remedial action at the Rochester Property site. The alternatives for remedial activities selected by EPA include in-situ air sparging to treat contaminated groundwater and a venting system to facilitate vapor discharge from the vadose zone.

In concurring with this ROD, the South Carolina Department of Health and Environmental Control (SCDHEC) does not waive any right or authority it may have to require corrective action in accordance with the South Carolina Hazardous Waste Management Act and the South Carolina Pollution Control Act. These rights include, but are not limited to, the right to ensure that all necessary permits are obtained, all clean-up goals and criteria are met, and to take a separate action in the event clean-up goals and criteria are not met. Nothing in the concurrence shall preclude SCDHEC from exercising any administrative, legal and equitable remedies available to require additional response actions in the event that: (1)(a) previously unknown or undetected conditions arise at the site, or (b) SCDHEC receives additional information not previously available concerning the premises upon which SCDHEC relied in concurring with the selected remedial alternative; and (2) the implementation of the remedial alternative selected in the ROD is no longer protective of public health and the environment.

SF930450.WEB

This concurrence with the selected remedy for the Rochester Property Site is contingent upon the State's above-mentioned reservation of rights. If you have any questions, please feel free to contact Mr. Lewis Bedenbaugh at (803)734-5211.

Sincerely,

R. Lewis Shaw

R. Lewis Shaw, P.E.
Deputy Commissioner
Environmental Quality Control

cc: Hartsill Truesdale
Lewis Bedenbaugh
Keith Lindler
Rebecca Dotterer
Harry Mathis
Charles Gorman
Doug Johns

SF930450.WEB